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JPRS Report

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BBC Announces Ukrainian Service, Deal With Japan

92WT0188X London THE DAILY TELEGRAPH
in English 1 Jun 92 p 7

[Article by Jane Thynne, media correspondent: "BBC World Service for Ukrainians"]

[Text] The World Service will today begin broadcasts in Ukrainian, its first new language in more than a decade.

It is the first time the BBC has broadcast to the former Soviet Union in anything other than Russian. And executives have already indicated they would like to start services for other republics.

Miss Elizabeth Robson, the new service's head, said: "It is a challenge to be starting this when the country is feeling its way as an independent State for the first time since the collapse of Ukrainian statehood in 1920."

The service will be on air for seven hours a week, compared to the 56 hours devoted to Russian. It begins with an interview between Mr. Major and Mr. Leonid Kravchuk, the Ukrainian president.

Mr. David Morton, head of the Russian service, says the BBC is interested in reaching other republics, although policy decisions are made by the Foreign Office.

"Obviously, we'd love to have a Latvian and Estonian service, but it is a question of money," he said. "I do think we should have a Central Asian service, probably broadcasting in Uzbek, but that really depends how events develop in Soviet Central Asia. If the situation becomes unstable the Foreign Office might well say we think we need the BBC there."

The Ukrainian service is likely to be dominated by the nationalism issue although the effects of the Chernobyl nuclear disaster will also feature prominently.

Mr Olexiy Solohubenko, one of seven BBC Ukrainian producers, covered the disaster for Radio Kiev and his eight-year-old daughter is suffering from the effects of radiation.

"Chernobyl epitomises the Soviet economic situation in terms of poor workmanship and low responsibility by individuals," he said. "It should be seen as a warning of huge, future collapses just waiting to happen."

—The World Service has signed a deal to broadcast Radio Japan in four languages throughout Europe. The BBC hopes to use Radio Japan's transmitters in the Far East in return.

Cyprus Holds Meeting on Trans-European Telecommunications Network

NC2406162492 Nicosia CYPRUS NEWS AGENCY
in English 1706 GMT 23 Jun 92

[Text] Nicosia, Jun 23 (CNA)—A two-day international meeting began here Tuesday organised by the Cyprus Telecommunications Authority (CYTA) with the aim to link the countries of central and eastern Europe into a Transeuropean Telecommunications Network (TET), starting from Cyprus and Greece.

The meeting is being attended by representatives from Albania, Bulgaria, Greece, Cyprus, Czechoslovakia, Hungary, Poland, Romania, Yugoslavia and Lithuania.

The conference here is a continuation of the memorandum of understanding on the establishment of TET agreed in the Greek capital Athens in June 1991 between the above countries.

The initiative was undertaken by Cyprus and Greece to help these countries organise their networks, thus facilitating business and overall communication. Cyprus and Greece will serve as the centres for the traffic (communication lines) distribution to Europe, Middle East or even Singapore, Indonesia and Sri Lanka.

TET will serve traffic terminating to and originating from the countries of the signatories. It will also serve transit traffic through these countries and will contribute towards the progressive transition from analog to digital by 1995.

Each country has a specific deadline to complete its network.

This project, said Adamos Kritiotis, manager of the commercial services at CYTA, will help not only these countries but also communication between them.

Greece is currently chairing the management board meeting in Nicosia to monitor the creation of TET and the implementation of the Athens agreement. Kritiotis said the management board will probably ask participants to meet again by October this year to report on the progress.

The project will also contribute towards the aim to turn Cyprus into a "Telecommunications hub" in the area, Kritiotis added.

Finnish, Chinese To Jointly Produce Optical Terminal Equipment

92WS0621L Chichester INTERNATIONAL
TELECOMMUNICATIONS INTELLIGENCE
in English 4 May 92 p 13

[Unattributed article: "Nokia Announces Transmission Joint Venture"]

[Text] Nokia Telecommunications has signed a joint-venture agreement with the Gullin Institute of Optical

Communications to produce optical terminal equipment. The total investment is more than US\$5 million and is Nokia's first joint venture in China. The company began business relations in China in 1983.

Production is to begin this year and will include the manufacture of Nokia's DYNADCARD, MUXCARD, and LINECARD transmission products. The facilities will be based in Guangxi Province.

In January 1992, Nokia announced a 35 million markkaa contract for the supply of transmission equipment and optical cable to China (see ITI issue 325). Nokia Telecommunications has previously supplied both fixed and mobile networks to the Daqing Oilfield, as well as digital exchanges, digital transmission systems, and radio links to the Chinese Ministry of Railways and the Shengli and Liao He oilfields.

Hong Kong, German Companies To Jointly Develop Cordless Phones

92WS0621X Chichester *INTERNATIONAL TELECOMMUNICATIONS INTELLIGENCE* in English 4 May 92 p 3

[Article: "Far East Technology for Cordless Phones"]

[Text] Hong Kong-based SA Megga International has signed a collaborative agreement with Telenorma of Germany to develop and manufacture a new range of cordless telephones for the German and European markets. These will be based on the German specification for CT-1+ analogue transmission at 900MHz. The Hong Kong firm says it plans to invest HK\$2 million in the installation of a new production line for the phones at a factory in Dongguan, China.

Leung Ray-Man, Chairman of SA Megga, said, "We expect to produce 700 sets each day. Each will be priced at US\$170 to US\$250." He added that the phones will be sold in Europe under the Telenorma Bosch and Blaupunkt brands. Leung Ray-Man claims that his company has already spent HK\$14 million on research and development for the project.

Hungarian Kontrax, Helsinki Telephone Sign Contract

92WS0538X Budapest *COMPUTERWORLD/SZAMITASTECHNIKA* in Hungarian 14 Apr 92 p 1

[Article by Sandor Mester: "Kontrax Telekom; Alliance With the Finns"]

[Text] Kontrax Telekom and the Helsinki Telephone Company signed a contract last Monday at the Budapest Hilton hotel which is unique in Hungarian telecommunications. The two private firms agreed to cooperate in

the development of Hungarian telecommunications for 10 years. The Helsinki Telephone Company, formed 110 years ago, has the expertise to be of aid to Kontrax Telekom.

At a press conference held on the occasion of the signing of the contract Gabor Dicso, president and director general of the Kontrax Commercial Company, said that his firm had decided three years ago to begin activity in the area of telecommunications as well. They began by selling a family of telephone sets and then signed a contract with the Nokia Data Communications firm for sale in Hungary of digital telephone subexchanges. Later they expanded the offering with similar products from Ericsson. The organization of Kontrax was transformed in May 1991. The Kontrax Telekom Company is one of several joint-stock companies that were created.

The chief of Kontrax regards the creation of the First Pest Telephone Company as a milestone. MATAV [the Hungarian Telecommunications Enterprise] can be found among the founders of it (see Issue 51, 1991, of our journal). "We must enter the world of public telephone networks," Mr. Dicso said, formulating the strategic direction of Kontrax Telekom. He said that the new management of MATAV, directed by Pal Horvath, "like the former Communist leaders" is trying to "break up the monopolies from within."

Mr. Dicso emphasized that Kontrax is short of only one thing, experience. They talked with several international firms, including the Japanese NTT, to find a partner in this area. Finally the choice fell on the Helsinki Telephone Company, which readily offered its aid in creating the experimental background indispensable for dynamic growth.

Kurt Nordman, president of the Finnish partner firm, said that in his country there are 49 telecommunications companies in private hands. The number of lines operated by the private firms reaches 2 million, which is 75 percent of all lines. The remainder are operated by the state-owned Finnish telecommunications enterprise.

Pal Szoke, president of the Kontrax Telekom Company, said that his enterprise is preparing for a buyer's market, so they consider it important to master service provider's expertise as soon as possible. "We will try to get a 20 percent market share in telecommunications," he said.

"How much will the Finnish friendship cost Kontrax and what is the Helsinki Telephone Company risking?" we asked. Mr. Dicso said that Kontrax will pay for the consulting activity of the Finnish experts. Mr. Nordman gave an evasive answer, and after the press conference one of his colleagues, director Jukka Alho, said that the contract formulates broad frameworks of cooperation. Answers to concrete questions can be given only hereafter.

Government To Maintain Control Over Telecommunications

*HK2007032392 Beijing CHINA DAILY in English
20 Jul 92 p 1*

[By staff reporter Xie Liangjun: "Telecom Industry To Gain Momentum"]

[Text] China welcomes foreign investment, technology and management know-how to build its postal and telecommunications industry, a senior official said.

At a press conference last Saturday, Zhu Gaofeng, vice-minister of posts and telecommunications announced a series of newly-proposed development targets for the industry.

Business volume of posts and telecommunications should grow at an annual rate of 28 percent during 1991-95 and at a 20 percent annual rate during 1996-2000, he predicted.

To maintain that growth rate, Zhu said China will continue to make use of overseas investment and introduce advanced technologies, equipment and managerial know-how from abroad in "a more active and bolder way."

Overseas investment as it pertains to production or construction in the industry are welcome, said Zhu, adding that China's domestic telecommunications equipment market is also open to foreign manufacturers.

However, Zhu said that the Chinese Government will maintain its monopoly over the management of important communications services because the postal and telecommunications sectors are directly related to national security and sovereignty.

He noted that it is common international practice, especially in developing countries whose postal and telecommunications industries are undergoing a fast growth, for the government to maintain such control.

Between 1986-90, China's postal and telecommunications sector used \$12 billion of overseas loans and imported 3 million-channel programme-controlled telephone exchanges.

The nation's total number of installed telephones is targeted to reach 31 million by 1995 and 65 million by 2000. That means that there would be 2.5 telephones for every 100 Chinese by 1995 and 5 per 100 Chinese by the year 2000.

Zhu said that in Shanghai, Beijing, Tianjin and other major coastal cities, there should be 20 telephones for every 100 people in 1995 and 30-40 in 2000.

These new targets, which postal and telecommunications officials say could be surpassed, are likely to place China among the world's intermediately-developed countries in terms of postal and telecommunications facilities by the year 2030.

Ministry Upgrades Posts, Telecommunications Targets

*HK2107101792 Hong Kong CHING CHI TAO PAO
in Chinese No 27, 13 Jul 92 p 22*

[Article from "China Economic News" column: "Ministry of Posts and Telecommunications Upgrades Goal Related to Development of Posts and Telecommunications"]

[Text] During a recent inspection tour of Guangdong and Zhejiang, Yang Taifang, minister of posts and telecommunications, stressed: Construction related to posts, telecommunications and communications will be raised to a new level in the near future.

Because most of the targets related to the original goal of increasing eight-fold the total volume of posts and telecommunications business, as well as the principal communications capability, from the 1980 figures by the end of this century have already been achieved ahead of schedule in the Eighth Five-Year Plan, the Ministry of Posts and Telecommunications recently modified the original development targets. In his talk, Yang Taifang spoke on the objectives and tasks following the modification: The total volume of posts and telecommunications business around the country should reach 53.4 billion yuan by the end of the Eighth Five-Year Plan and 133 billion yuan by the end of the Ninth Five-Year Plan; the total number of all-network telephones [quan wang hua ji 0356 4986 6114 2623] should reach 31 million sets by the end of the Eighth Five-Year Plan and 65 million sets by the end of the Ninth Five-Year Plan; urban telephone automation should be achieved for all cities above county level around the country, rural telephone automation for all developed regions and urban-rural long distance telephone connection should be implemented by the end of the Eighth Five-Year Plan, and the digitization of transmission exchanges for telephone networks above county level around the country should be reached by the end of the Ninth Five-Year Plan. In the Eighth Five-Year Plan, the post office should also establish a relatively independent network for rapid cable and post delivery. According to analysis, these targets are roughly twice the original ones.

Minister Yang indicated that special attention should be paid to the rate of communication development in regions along the coasts, rivers, and borders.

Minister on New Development of Telecommunications

*HK0507062192 Beijing LIAOWANG in Chinese No 21,
25 May 92 p 13*

[Article by Zhu Gaofeng [2612 7559 1496], minister of posts and telecommunications: "China Makes New Advances in Telecommunications Industry"]

[Text] The subject of the 24th World Telecommunications Day on 17 May this year was "Telecommunications and Space: The New World." That day, the member countries of the International Telecommunications Union gave publicity to telecommunications services and relevant knowledge in various forms. I want to take this opportunity to brief the vast number of readers on the high-speed development of telecommunications in our country since the beginning of reform and opening, the adoption of new technology, and the prospects of their future development.

After the founding of the People's Republic, telecommunications services in our country made great advancements, but it was in the last 10 years that a telecommunications network extending in all directions was built up. For example, the number of telephone exchanges increased to 1,749,000 lines in 1978 or 5.6 times that in 1950, but the total number of telephones in the whole country was still smaller than that in Hong Kong. According to statistics in 1991, the total capacity of local telephone exchanges in the whole country reached 10.4 million lines or 5.9 times that in 1978. That is, the number of local telephones increased by an average of 14.6 percent every year. In addition, there were 19,000 long-distance telephone lines in our country in 1978; the number increased to 152,000 lines last year, being 8.1 times the number in 1978. The average annual increase rate was 17.4 percent. Last year alone, the number of long-distance telephone lines in our country increased by 38,000; this figure was twice the total number of long-distance telephone lines in the whole country in 1978.

As compared with developed countries, the quantity of telecommunications service in our country still lags behind. In 1978, telephone use rate in our country was merely 0.4 percent. From 1978 to 1991, although the population in our country increased by 15 million people every year, telephone use rate increased to 1.29 percent in 1991. At present, the total number of telephone sets in our country ranks 12th place in the world, but the telephone use rate ranks behind 100th.

Over 10 years, our country's postal and telecommunications services not only developed quantitatively, but also made a leap forward qualitatively. By the end of last year, the proportion of automation in local exchanges had reached 97.5 percent. Last year, 76 percent of long-distance telephone calls were connected through the automatic exchange network. As for adoption of the digital technology in the telecommunications network, in 1985, only 4.5 percent of telephone exchanges in our country were digital exchanges; last year, the proportion of digital exchanges increased to 56.6 percent. By the end of last year, digital exchanges had accounted for 96.4 percent of the long-distance exchanges.

In the last few years, our country has adopted a great deal of new technology in the field of telecommunications. At present, such advanced means as satellites, fiber-optic lines, and digital microwave have been adopted on a large scale in our country's telecommunications network.

The technology of satellite communications appeared in 1971, but our country successfully launched the first test static communication satellite in 1984, and later successfully launched five communication satellites in succession. In the last few years, communication satellites in our country fulfilled such communication tasks as television and radio broadcasts, telephone, facsimile, and data processing in the Ministry of Radio, Film and Television, the State Education Commission, the Ministry of Energy, the Ministry of Water Resources, and the People's Bank of China. In September 1990, Lhasa, the last provincial capital in our country, was brought into the national long-distance automatic telephone network through satellite circuits so that people in Lhasa can directly dial automatic telephone calls to all parts of the country and the world. At present, the number of television transmission stations [dian shi dan shou zhan 7193 6018 0830 2392 4541] has increased from 53 in 1986 to more than 30,000 at present. The number increased by an average of about 5,000 every year. The coverage rate of television broadcast and television education increased from 30 percent to over 80 percent. In the field of international communications, 443 cities and counties in our country have access to direct dial international telephone, telegraph and low-speed data transmission services to 196 countries and regions in the whole world.

After the completion of the satellite ground stations in Chengdu and Qingdao in 1991, the number of satellite ground stations in our country reached 20. Moreover, a batch of 12 new satellite ground stations are now under construction. In the 1980's, profound changes occurred in our country's telecommunications systems. This not only initially mitigated the backward and strained condition of telecommunications in our country, but also laid a foundation for greater development in the period of the Eighth Five-Year Plan and in the next 10 years to meet society's needs for telecommunications service.

Along with our country's economic development and the continuing in-depth development of reform and opening, communications will certainly enter a period of accelerated development. We shall speed up the pace of building and reforming the postal and communications system and consistently build up socialist communication undertakings with Chinese characteristics. In the next 10 years, the capacity of the public telephone network will be further expanded; local urban telephone calls at and above the national level will be automated, and long-distance calls will be direct-dial; telephone service in the countryside will also be automated and will be linked with the urban networks, and digital technology will be generally adopted in the telephone transmission and exchange at and above the national level. In the period of the Eighth Five-Year Plan, the volume of telecommunications service, the capacity of communications and the telephone use rate will double that of the current level. Greater development will be made in the period of the Ninth Five-Year Plan. We are full of confidence in the future.

Qinghai Satellite Center To Begin Operation in 1993

HK1307094192 Xining Qinghai People's Radio Network in Mandarin 2300 GMT 2 Jul 92

[Excerpts] The construction of the Qinghai Satellite Remote Sensing Information Service Center has recently started. [passage omitted]

The Qinghai Satellite Remote Sensing Information Service Center is a project built with investment made jointly by the Qinghai Provincial Planning Commission and the State Meteorological Administration under the auspices of the Qinghai Provincial Meteorological Bureau.

The project includes a meteorological satellite signal reception and processing system, a satellite ground resources processing system and a ground meteorological satellite information supervision and relay network that links all meteorological stations across the province.

In accordance with the existing plan, the construction of the Qinghai Satellite Remote Sensing Information Service Center is to be completed in 1993.

Shanghai Building Indian Ocean Satcom Ground Station

92P60315X Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 5, May 92 p 48

[Untitled news brief by Yi [6318]]

[Text] In order to improve communications between Shanghai and the European mainland, Shanghai is building an Indian Ocean communications satellite ground station which will serve as a sister station to the existing Shanghai Pacific Ocean satcom ground station. Overall investment for the entire project is 30 million yuan, and the main communications equipment is being imported from the United States. The project, to be completed within the first half of this year will open up 600 voice circuits and permit simultaneous receiving and sending of two satellite TV programs.

15,000-Kilometer Fiber-Optic-Cable Trunkline To Be Built

92P60343X Beijing RENMIN RIBAO in Chinese 10 Jun 92 p 1

[Article by Jing Xiaolin [2529 4562 2651]: "Large-Scale Fiber-Optic Cable Trunkline Project Unfolding"]

[Summary] Beijing, 9 June (ZHONGGUO XINWEN SHE)—China has allocated investment funds for the construction of a number of fiber-optic cable communications trunkline projects. Construction of this 15,000-kilometer-long large-scale trunkline network, which will link up 21 provinces and municipalities, is now fully unfolding. The large-scale trunkline network consists of

a Beijing-Shandong-Nanjing trunkline, a Zhengzhou-Xian-Chengdu trunkline, a Beijing-Wuhan-Guangzhou aerial trunkline and a Beijing-Shenyang-Harbin trunkline. Contracts for provision of some of the fiber optic cable and equipment for these projects are being let to international bidding, while initial construction has already begun. The entire project is scheduled to be completed and operational within a few years. An MPT official revealed that when construction is completed, the nation's communications trunklines will have tripled and long-distance transmission ability will have increased at least by a factor of 10.

1.55-Micron Unrepeated Fiber-Optic Cable Passes Check

92P60309A Beijing RENMIN RIBAO in Chinese 13 May 92 p 1

[Article by Lu Xinning [4151 2450 1337]: "New Breakthrough in Nation's Fiber-Optic Communications Technology: Nanjing-Wuhu Fiber-Optic Cable Communications Project Passes Acceptance Check"]

[Summary] Beijing, 12 May—The nation's first 1.55-micron unrepeated fiber-optic cable communications system—the 110-km-long Nanjing-Wuhu fiber-optic cable communications project—passed state acceptance check a few days ago. The system's technical quality meets international advanced standards, indicating yet another breakthrough in domestic optical communications technology. The Nanjing-Wuhu line uses the new-generation bundle-tube fiber optic cable jointly developed by Northern Jiaotong University Prof. Jian Shuisheng [4675 3055 3932] and the Beijing (Electric) Wire Plant. The Shanghai Railway Office's Survey and Design Institute and the Beijing Optical Communications Co. acted as overall contractors. With the new 1.55-micron-wavelength technology, one fiber-optic cable can carry up to 480 simultaneous digital voice circuits at the DS3 [i.e., 34 Mbps] transmission rate. If optical frequency-division multiplexing [OFDM] technology is added, the system can carry over a hundred million digital telephone circuits.

High-Power TV Station Planned in Guangdong

HK1006133192 Hong Kong MING PAO in Chinese 4 Jun 92 p 10

[Unattributed report: "Recent CPC Overseas Propaganda Work Meeting in Shenzhen Discusses Plan To Set Up New Television Station in Guangdong With Programs Beamed to Zhu Jiang Delta and Hong Kong"]

[Text] According to a report from Shenzhen, the CPC's central authorities responsible for overseas propaganda recently held a meeting in Shenzhen to study and arrange steps for strengthening the Chinese side's propaganda work for the late transitional period in Hong Kong. According to sources, it was proposed at the meeting that a television station with the beaming power to cover the

Zhu Jiang Delta area and the Hong Kong area be set up to offset the influence of the Hong Kong television in the mainland areas and to strengthen the positive propaganda to Hong Kong.

The overseas propaganda work conference was held last Wednesday [27 May] in Shenzhen. Zhu Muzhi, head of the CPC Central Overseas Publicity Group and director of the State Council's Information Office, particularly went from Beijing to Shenzhen to preside over the meeting. The responsible officials of various departments concerned in the XINHUA Hong Kong Branch also attended the meeting.

According to sources, the meeting mainly discussed and arranged steps for increasing the Chinese authorities' opinion influence in Hong Kong during the late transitional period, including operation of the mainland media and the left-wing newspapers in Hong Kong.

It was proposed at the meeting that in order to change the current situation in which people in the Zhu Jiang Delta area and in Shenzhen only watch the Hong Kong television programs, a new television station be set up in Guangdong with its programs being beamed to the Zhu Jiang Delta area and Hong Kong as well. Thus, the residents of the mainland area can have more choices when watching television; at the same time, the mainland can also strengthen propaganda toward Hong Kong. The programs of the new television station will mainly be entertainment programs, economic information, and local affairs.

It was said that the meeting put forth a number of options for the location and organizational form of the new television station. It may be set up with Beijing's direct investment in a suitable place inside Guangdong, or may be set up on the basis of the existing equipment of the Guangdong Television Station or the Shenzhen Television Station with the beaming power being increased. The meeting did not make the final decision on which option is to be adopted.

Yesterday, the Guangdong officials responsible for overseas propaganda told MING PAO that so far, they had not received Beijing's order on setting up a television station to beam programs to Hong Kong. However, Guangdong had studied the possibility of setting up a television station with higher power to strengthen propaganda in the Zhu Jiang Delta area.

On the other hand, an official of the Guangdong Provincial Radio, Film, and Television Department said that Guangdong has the intention of beaming its radio and television programs to Hong Kong and other overseas areas, and the scheme has been submitted to Beijing. At present, Guangdong and Hong Kong are cooperating closely in producing radio and television programs, which are mainly some sports and cultural programs. The rapidity and capacity of Guangdong's radio and television broadcast rank first in the whole country.

This official also said: Guangdong's plan to beaming programs to Hong Kong is not derived from a strong sense of resisting peaceful evolution; instead, the idea is derived from the hope to participate in the competition among the mass media.

REGIONAL AFFAIRS

Wuhan Group Forms Joint Venture With NEC

92P60315Y Beijing DIANXIN JISHU
[TELECOMMUNICATIONS TECHNOLOGY]
in Chinese No 5, May 92 p 48

[Summary] On 10 February 1992, the Wuhan Municipal Changjiang Optical Communications Industries Group formally reached agreement with Japan's NEC and Sumitomo Corporation to establish Wuhan-NEC Optical Communications Industrial Ltd. This new joint venture will import NEC's optical communications systems production technology permitting annual output of 4,000 optoelectronic terminals, monitoring systems, and testing equipment. A series of optical communications products are to be on the domestic and foreign markets by the third quarter of this year and will be compatible with products made by Changfei Optical Fiber & Cable Ltd. (a Sino-Dutch joint venture also based in Wuhan) and by another Sino-Japanese joint venture, Tianjin-NEC Ltd.

LAOS

Senior Official Discusses Policy, Foreign Aid

92WT0190X Vientiane PASASON in Lao 27 May 92
pp 2-3

[Text] Mr. Padapphet Saignakhot, the head of the project for developing the telecommunications system of the Postal Company, which is affiliated with the Ministry of Communications, Transportation, Posts and Construction, revealed that in the period from liberation to 1987 the telecommunications system in our country used old equipment—this was especially true of the telephone equipment used for communicating between Vientiane and the various provinces. In 1987 there was a project which involved borrowing \$3.3 million urgently from the World Bank to improve communications by means of a radio system in five provinces: Luang Prabang, Vientiane, Khammouan, Savannakhet, and Champasak, and to build a small telephone center to handle 1,000 telephone lines. In addition there was also a grant from Australia for a small eight channel satellite system to communicate abroad. Then there was assistance from France to build a microwave system to communicate between Vientiane and Paksan. Second stage projects for a modern, permanent telecommunications system are to take from 1991 to 1993. These will include construction

projects and the installation of new equipment in six provinces. The old equipment will be moved to other provinces for which there are no such projects. The World Bank has loaned \$24.5 million for these projects. The first project involves construction of a microwave system which will transmit between Luang Prabang, Vientiane, Paksan, and Pakse. The second project involves the construction of a [cable] network in six towns: Luang Prabang, Paksan, Khammouan, Savannakhet and Pakse [as published]. The third project will be funded by a grant from the Japanese Government of \$11.7 million; it will install 17,200 telephone lines in six provinces; this project will complete installation of 6,000 telephone lines in Vientiane by the end of 1992. It is expected that these will be in service by December of this year and that by the end of 1993 the various projects in the five provinces will be completed so that one will be able to dial a number abroad and telephone from abroad to a number here automatically. There is also the microwave project for communications between Vientiane and Nong Khai which will cost \$400,000 to be provided by a grant from the Fujitsu Company of Japan. It is expected that this will be ready for use by March 1993. The government of France also provided 9.1 million francs to set up an automatic teleprinter which can handle 450 lines; it is now completed and in service. In addition the postal company has purchased a telephone central which can handle 800 telephone lines to take care of the problem in the meantime; this is now also in service. The postal company has also ordered 400 wireless telephones for installation and it is expected they will be ready for service by June. There has also been foreign investment, for example the Asia-Pacific Electronics Company of China has invested and set up a radio paging system which is in service. The postal company has also ordered a hat-ef [HF] radio system to provide communications for 14 provinces and throughout the country. This is expected to be in service by the end of the year. The postal company is also purchasing a satellite ground station over five years together with Australia which will increase the telephone channels from eight to thirty. It is expected that by July 1992 this system will be able to handle in- and outgoing calls and automatic direct communications. At present it can only handle incoming calls.

Mr. Padapphet also said that because the equipment was very old there were problems with telephones being out of order and calls not going through. Company officials acknowledged the facts of their service but expected that when the new equipment would be installed and the old equipment was all taken out, service would improve.

HUNGARY

Pending Telecommunications Law Discussed

92WT0205A Budapest HETI VILAGGAZDASAG
in Hungarian 20 Jun 92 pp 80-82

[Article by Tamas Szalai: "The Legislative Proposal on Telecommunications; Token Torments"]

[Text] *Is it going to be possible to create a telecommunications law capable of breaking up the monopoly that was, some time ago, perceived as beneficial? The legislative proposal pending in parliament raises concern that the power of the influential interest group—evolved on political grounds at first, and later for professional reasons—rallying around the specialized ministry might be stronger than anything else.*

Hungarian citizens—by far not spoiled insofar as expectations to obtain telephone service are concerned—pin great hopes to the termination of the state-owned MATAV [Hungarian Telecommunication Enterprise] over a period of time. A theoretical possibility for this has been established as a result of a concession system based on an overall law adopted by parliament last year (HVG 18 May 1991). The grant of concessions to perform services is based on the idea that the state surrenders its earlier exclusive role in basic telecommunications services. Since the state assumes a certain responsibility for appropriate service provisions to consumers, it continues to more or less organize the market even under the concession system. Firms agreeing to deliver given services obtain concessions to temporarily exercise the state's monopolistic rights, and the grant of concessions is made in the framework of a competitive bidding system.

Since the presently dependent populace as well as telecommunications firms looking forward to an outstanding business opportunity regard the future telecommunications law as the redeemer, the fact that the legislative proposal leaves certain essential questions clearly unanswered is remarkable. Beyond a sketchy statement concerning the contents of the concession bidding system, the framers of the text would leave all the "devilish details" to ministerial decrees. For this reason many suspect that the remarkably sketchy draft might serve to frustrate telecommunications companies pounding at the door.

The legislative proposal submitted to parliament reveals only this much: The basic telecommunications grid must be operated by concessionaries, and concessionaries should also provide mobile and cable telephone services accessible to everyone, just as personal calling services. The proposal also stipulates that regional and national television and radio broadcast be operated in the framework of concessions, of course.

Accordingly, the possibility of legally sanctioned intervention by ministers is extremely broad. Thus, entrepreneurs envisioning good business opportunities in telecommunications can be convinced of not being the subjects of a squeeze-out game played by those who presently dominate the market (MATAV, Broadcasting Enterprise, and the Frequency Allocation Institute) only if the competent ministry exercises its decreeing authority based on the recommendations of an independent body. A body like this could be a forum that mediates conflicting interests in the field, or an advisory body composed of respected, authoritative, independent professionals.

Because interference by the authorities would not be legitimate, it could be worthwhile for entrepreneurs to win over to their side those who act as the patrons of the authorities, not to mention the fact that their business plans could materialize easier if they became associated with the influential enterprises that have the upper hand due to their previous monopolistic situation. More than one of the various regional telephone companies has chosen this route. Kontrax, for example, has contributed 700 million forints to the First Pest Telephone Company's 2-billion-forint basic capital. The company was established with a 32.5-percent MATAV capital contribution, and promises telephone lines in a few administrative districts of Budapest.

For this reason the legislative proposal provides for the establishment of a so-called Telecommunications Council (TT), an organization to ensure not only the legality of interference by the ministry, but also the acceptability of such interference to interested persons, according to the legislative intent. But the legislative proposal reveals only this much about the TT: Its "chairman shall be appointed by the prime minister for a four-year term, and the chairman shall appoint the TT's members for the duration of his term of office. The TT shall formulate governmental positions regarding telecommunications policy and development, and shall make recommendations concerning proposals which affect consumers, or significantly influence the telecommunications market. The TT shall establish its own order of proceedings."

Missing from the legislative intent are, for example, conflict of interest rules. Thus even the chairman and president of MATAV—a future competitor in acquiring concession rights—could become the TT chairman. Although in the drafting stages of the legislative proposal the idea that parliament dispose over the TT chair—based on the British example—had been mentioned, it had been rejected in the end during the interministerial reconciliation of the proposal.

The idea of an organization working alongside the government to provide comments did not make sense, according to a substantive amendment introduced during general parliamentary debate concluded last week. According to the joint proposal introduced by Laszlo Pal (MSZP [Hungarian Socialist Party]), Lajos

Kosa (FIDESZ [Federation of Young Democrats]), Kalman Katona (MDF [Hungarian Democratic Forum]) and Bela Nemeth (FKgP [Independent Smallholders Party]) there was no need for such an organization unless it exercised authority and had functions to perform. The proposal recommends the establishment of a telecommunications fund instead of the TT. This fund would sustain itself from concession fees, state or private contributions, privatization revenues related to telecommunications, and fines. According to the legislative intent supporting the proposed amendment, economically backward areas could be supported through this fund and the flow of these not insignificant amounts of money could thus be controlled. In addition, the fund could also guarantee loans taken out to finance the development of the telecommunications network.

It is noteworthy that originally the ministry having jurisdiction had also been thinking in terms of establishing a fund with similar functions, but the idea had been rejected in the course of the interministerial reconciliation of the legislative proposal presumably in response to pressure exercised by the Finance Ministry. The Finance Ministry argued that a fund like this could serve as a vehicle for the regrouping of moneys in circumvention of the state budget, thus also reducing the latitude of the Finance Ministry at a time when it is forced to fill gaping holes in the budget. In given cases funds could be provided this way to support less developed regions, e.g., by reinvesting concession fees.

Openness could serve as a check on the appropriate functioning of the bilevel legislative proposal establishing conditions for telecommunications, according to the ministry's spokesman. In drafting ministerial decrees resolving special problems not provided for by law (e.g., the adoption of international standards by Hungary), the ministry could obtain assistance from a Telecommunications Interest Reconciliation Forum, to be established later if the interested parties took advantage of this opportunity. Based on rights established in the legislative proposal, however, it would not be surprising if participants in the telecommunications battle did not see much fantasy in this opportunity provided for interest groups.

The legislative proposal has this to say about the rather limited scope of authority of the above-mentioned forum: "Comments shall be sought from consumer, entrepreneur, and local government interest groups, and

the opportunity to comment must be provided to the affected parties." The framers of the proposal believe that if the law were to require concurrence by the forum, or if the forum could veto e.g., the setting of telecommunications rates, no decision could ever be made by the forum due to an endless flow of comments trying to enforce special interests.

Professionals believe that the opportunity for strong interest groups rallying around the competent ministry to interpret the substance of the overly general provisions of the legislative proposal according to their own liking is not the only matter that raises concern. Competition neutrality is also threatened by a proposed provision that would permit MATAV to operate without concessions for two years beginning on the effective date of the law. This would enable the state-owned enterprise supported by several international financial organizations to acquire an advantage as a result of its own technological development, one that could hardly be matched by others.

The fact that the law had not been enacted last spring, as discussed earlier, resulted in a rather significant blood-letting by firms that envision business opportunities in telecommunications even without MATAV's participation, such as Patotacom Corporation, the joint venture established by Instrumentation Technology and the local government of the 15th District of Budapest. Based on the competent parliamentary committee's decision, the legislative proposal is not slated to be presented to the plenary session before parliament's summer recess. Telephone companies throughout the country experience rather grave difficulties in complying with telephone installation schedules promised to their subscribers (HVG 11 April 1992) and, in retrospect, prove to be rather risky undertakings due to the additional delay in legislation.

Entrepreneurs expect the new law to clearly define the way in which local telephone systems are going to be connected to the nationwide basic network. Based on the legislative proposal, MATAV—still enjoying a temporary monopoly—could refuse to connect local telephone systems to the basic network only if connecting these systems "is not feasible based on technical criteria established by the minister." According to the ministry that submitted the legislative proposal, these criteria provide standard parameters based on international agreements. No one is able to predict, of course, how the TT is going to view these parameters.

CUBA**Havana on U.S. Vote on TV Marti Suspension**

*FL3107182092 Havana Radio Rebelde Network
in Spanish 1700 GMT 31 Jul 92*

[Text] The broadcasts by an anti-Cuban television station sponsored by the U.S. Government have been condemned by international figures and organizations because they are illegal. Opinions within the U.S. administration are also divided.

The U.S. House of Representatives voted to suspend funds for these broadcasts in a session held yesterday. In a vote of 206 in favor and 194 against, the legislators decided late last night to shut down the cynically named

TV Marti. Its effectiveness has been thwarted by constant jamming by Cuban technicians, who have more than overcome the Yankee technology developed for that purpose.

Democratic Representative Bill Alexander from Kansas [as heard] called for the suspension, beginning on 1 October, of the \$13 million allocated to the TV station. Alexander asserted that TV Marti is a relic of the cold war and added that the suspension is obligatory, since it is wasting money on an audience that does not exist. The case will now be studied in the U.S. Senate at an unknown date before the definitive shutdown of the anti-Cuban TV station is decided. In the past few years, the broadcasts have been condemned by experts and institutions from several countries for being a flagrant violation of international laws on communications.

REGIONAL AFFAIRS

Kuwaiti Fund To Grant \$35 Million for Communications to Lebanon

NC2307211192 Shanayh Voice of the Mountain in Arabic 1130 GMT 23 Jul 92

[Text] Minister of Post and Telecommunications George Sa'adah today initialed an agreement under which the Kuwaiti Fund for Arab Economic Development will give a \$35-million loan to Lebanon. At a news conference held after the initialing ceremony, Sa'adah said the loan will bear a 2.5-percent interest rate and will have a grace period of four and a half years. The loan will be repaid in 62 biannual installments, beginning on 15 May 1997 and ending on 15 November 2012.

Sa'adah said the loan will be used to finance a project to establish modern local telephone networks in 45 Lebanese areas with a capacity of 171,000 lines. The loan also will be used to expand and modernize the telecommunications network in the country in the coming 10 years.

Kuwaiti Fund head Dr. Mustafa al-Kayyal stressed Kuwait's determination to help Lebanon. He indicated that this is the second soft-term loan granted to Lebanon, adding that the fund will study Lebanon's needs in all sectors to provide the necessary aid.

New Shortwave Broadcast From Sudan To Reach Egypt, Gulf States

NC2806045492 Cairo MENA in Arabic 1635 GMT 27 Jun 92

[Text] Khartoum, 27 Jun (MENA)—As of today, the Arab Republic of Egypt and the Arab Gulf countries will be able to receive Sudan's Omdurman Radio after a 20-year interruption. This was stated by Staff Colonel Sulayman Muhammad Sulayman [name as received], member of the Revolutionary Command Council for National Salvation and minister of culture and information, at the dedication of a new station transmitting on the 41-meter shortwave.

Col. Sulayman said that the official Omdurman Radio will reach all parts of the world before the end of this year with the installation of two new stations, one international and one African.

AFGHANISTAN

Jihad Council Forms Committee to 'Control' Radio-TV

NC2006143292 Kabul Republic of Afghanistan Television in Dari to Regional Stations 2100 GMT 19 Jun 92

[Text] The Jihad Council met under the chairmanship of esteemed Professor Sebghatollah Mojaddedi, chairman of the council and embodiment of the Islamic State of Afghanistan, at Gol Khana Palace today. Present at the

session for the first time were members of the Hezb-e Vahdat-e Eslami of Afghanistan and the National Islamic Movement of the North.

During the session, discussions were held on the nation's major problems and security in Kabul. Additionally, a delegation comprising one member from each group was formed to study and control [preceding word in English] radio and television programs. The group will ensure that the media acts according to the policy of the Islamic State of Afghanistan in reflecting truths and realities and in serving all the strata of the people of Afghanistan.

Building of Radio, TV Complex To Resume

NC1906170492 Kabul Republic of Afghanistan Television in Dari to Regional Stations 2100 GMT 16 Jun 92

[Text] Planning Ministry Head Hojjat ol-Eslam val-Moslemin Seyyed Mohammad 'Ali Jawid, along with ministry deputies and (Seyyed Ya'qub Asil), director general of radio, television, and AFGHANPEN, visited the massive new radio and television complex project on which work had been suspended for the past three years.

Foreign countries could be approached for financial and technical assistance to complete the project. An Afghan radio, television, and AFGHANPEN source told the BAKHTAR news agency that three television studios and their peripheral installations were built on 750 square meters on credit worth 10 million rubles from the former Soviet Union in 1965 [year beginning 21 March 1986]. Construction and assembly were expected to be completed in five years.

When the Soviet contingents left Afghanistan, the construction and (?completion) entrusted to the Soviets was halted. Some 46 percent of construction work was completed. The source said: With credit worth \$11 million from the former German Democratic Republic [GDR], construction work on the radio project was initiated in 1965, completion and operation expected in eight years. This was also suspended with the departure of the Soviet contingents and the German experts. Some 46 percent of this project's 14 radio studios and film-dubbing department spread over nine blocks was completed. The television correspondent interviewed the esteemed Jawid:

[Begin recording] [Correspondent] Esteemed Planning Ministry Head Hojjat ol-Eslam Mohammad 'Ali Jawid: You know [words indistinct] and we should say that foreign sources will meet the cost. What measures have you envisaged?

[Jawid] In the name of God, the compassionate, the merciful. We learned that two radio and television station complexes were left incomplete, that part of the television complex had been completed by the former Soviet Union, and part of the radio complex by the former GDR. Following the departure of the Soviet forces from Afghanistan, the Germans left and the project was suspended.

Radio and television are important in every country, particularly in our country, where they have a low profile and where radio reception is not good. While it was being boosted by the Central Asian republics it was fine, but then the quality of sound deteriorated so much that not only are neighboring countries unable to hear it, but it is barely audible in some Afghan provinces. Our television reception is also weak; I think the transmitter in Kabul can only transmit locally. Some other stations in the provinces have their own transmitters.

For a nationwide television network and good radio to relay to the world our message on the oppression and deprivation of our people, radio and television are the government's eloquent tongues. Praise be to God, an Islamic Government has been established. This tongue [radio and television] should be strengthened so that we can speak to the world with a strong voice and show it a strong picture.

We were eager to inspect these departments, which we see are incomplete. Certain countries have expressed an interest in collaborating with us, giving us credit or other assistance to complete the work. We may approach these sources and, God willing, elicit the necessary help, particularly from Germany, because East Germany had already agreed to complete the project. Now that Germany has been unified, it is obliged to accept East Germany's commitments. As for completing the television complex, we will see what sources benefit our people and we will use them, God willing, to complete this project.

[Correspondent] Thank you. We pray to God for your greater success and thank you for your explanations.

[Jawid] Thank you and salutations. [end recording]

BANGLADESH

Import, Use of Dish Antennas Permitted

92WT0195A Dhaka THE BANGLADESH OBSERVER
in English 20 May 92 p 1

[Text] The Government has decided that import, use and giving license of T.V.R.O. or dish antenna will remain open for all subject to the payment of existing tariff, tax and their duties on it, reports BSS.

The decision was taken at an interministerial meeting held at the conference room of Ministry of Information under the chairmanship of Information Minister Barister Nazmul Huda.

The meeting was attended by Post and Telecommunications Minister Mohammad Keramat Ali, Commerce Minister M.K. Anwar, Industry Minister Shamsul Islam Khan, Secretary, Ministry of Information, Secretary, Post and Telecommunications and senior officers of the concerned ministries and organisations.

The meeting held detailed discussions on implementation of the decision taken at a recent cabinet meeting regarding import, production and use of dish antenna in Bangladesh.

Intending people to know about the existing tariff, tax and other duties on import of dish antenna have been advised to contact National Board of Revenue.

The meeting decided that industry for manufacturing of dish antenna can be set up under the existing industrial policy to bring down the price level of dish antenna within the reach of the people. The Information Ministry will also take decision on the licence fee for use of dish antenna which will be made known to all through a Government notification soon. However, any body can import and use dish antenna or T.V.R.O. paying the existing tariff, tax and other duties pending the publication of Government notification of licence fee.

The meeting further decided that after the issuance of the Government notification on licence fee, the users of dish antenna or T.V.R.O. will have to pay licence fee and other related fees as per the provision of the notification.

EGYPT

Cairo Radio Director on Plans To Update Transmissions

NC1107091292 Cairo AKHIR SA'AH in Arabic 1 Jul 92
p 32

[Report on an interview with Cairo Radio Director Hilmi al-Buluk by Tuhani Muntasir; place and date not given]

[Excerpts] On the ninth Media Day, President Husni Mubarak and Information Minister Safwat al-Sharif dedicated a new radio transmission station. The station uses a powerful 1,500-watt transmission to beam the programs of the Cairo's main network—the General Program [Cairo Arab Republic of Egypt Radio Network], making it the strongest radio broadcast in the Arab world.

With this powerful transmitter in place, Egyptian radio has entered a new age, ending the earlier difficulties of the General Program transmission once and for all. Prior to the inauguration of the station, the General Program suffered from as many as 500 interruptions, a few seconds each, every day.

Following the return of the transmissions to its normal state, I asked Director Hilmi al-Buluk about the trouble and how it was resolved. He said:

[Al-Buluk] The interruptions were due to the poor state of the old transmitter, which should have been discarded years ago. I noticed the old transmitter's problems, and we began looking into replacing it. Subsequently, we bought and installed a new station powered by a 1,500-watt transmitter, which gives a clearer signal at a wider

range. The transmission of Cairo's main network will now reach many distant places in the Arab world and southern Europe. The transmission will reach the entire Arab Peninsula, Syria, Lebanon, Jordan, Tunisia, Libya, and Algeria. The broadcast will also become clearly audible in Italy, Greece, and southern France at night.

[Muntasir] Will you modernize other radio networks?

[Al-Buluk] We have been doing that for the past two years. The Voice of the Arabs [an important station during 'Abd-al-Nasir's time that the bureau does not currently monitor] has been modernized as part of a comprehensive plan to update all radio transmission stations. We built a modern and powerful station for the Voice of the Arabs. We did the same for the Middle East radio station, which can now be received in Canada, Europe, and even some Latin American countries. This means that Egyptian radio has actually entered a new phase, that of the very powerful transmitters, and has become competitive with other well-known international radios. We intend to modernize other stations very soon. The regional stations transmitting on FM, however, will not be changed because they are doing what they are meant to do, that is, cover nearby areas. [passage omitted]

[Muntasir] How would you compare Cairo radio with the BBC?

[Al-Buluk] It is quite possible to compare them and favor Cairo radio. The bottom line, however, is that of resources and funding. Some international radios draw on unbelievably huge budgets. We have to function within our limitations as a developing country. It would not be an exaggeration to say that the Egyptian radio networks are ahead of thousands of other radios, thanks to the efforts of our dedicated and experienced staff.

It is no secret that Minister al-Sharif is quite busy thinking of ways to make the true voice of Egypt heard in every corner of the world. He is examining the possibility of renting transmission and relay stations in European countries and islands to use them to beam Egyptian radio broadcasts. Our radios are liked and respected abroad as well.

Arabsat To Build Two New Satellites

NC3007151892 Cairo Arab Republic of Egypt Radio Network in Arabic 0400 GMT 29 Jul 92

[Text] Transport and Communications Minister Sulayman Mutawalli has announced that the Arabsat General Assembly has agreed to build two new satellites, one to be launched in 1995, the other to be kept in reserve for emergencies. At the end of the assembly's 15th session last night, the minister said that a committee will be set up to study offers by foreign companies to manufacture the two satellites, the total cost of which is \$260 million.

The minister said the agreement to build the new satellites is a major step in Arabsat's history. He said Egypt and Syria were elected members of the new Arabsat board of directors.

ESC To Rent Intelsat Channel for Europe-Wide Transmission

*NC2207140792 Cairo MENA in Arabic
1908 GMT 21 Jul 92*

[Excerpt] Cairo, 21 Jul (MENA)—Amin Basyuni, secretary general of the Radio and Television Union, has announced that based upon directives from Information Minister Safwat al-Sharif, contracts will soon be signed to rent one channel of the European satellite, Eutelsat, enabling the Egyptian Space Channel [ESC] to transmit its programs throughout Europe. Egyptians and the Arab communities in Europe will be able to view from a satellite, instead of the current cable network, transmissions which do not reach every part of the continent. [passage omitted]

INDIA

Indian Scientists Achieve HDTV 'Breakthrough'

*92WT0203X New Delhi INDIAN EXPRESS in English
12 Jun 92 p 7*

[Article by R.K. Mattoo]

[Text] Bangalore—Indian scientists have achieved a breakthrough in the development of the world's first digital high definition (HD) TV receivers that can also be applied to home information systems such as video-phones. The first prototype of the ASIC (Application Specific Integrated Circuit) using a digital signal processing technology for video and audio will be assembled soon.

According to Prof J.P. Raina, co-ordinator of a Rs 18 crore national project of the Department of Electronics (DoE) to develop digital TV, home information systems and HD-TV, this technology will enable the Indian consumer electronic industry to bring out TV sets that will meet most of the world's TV standards through vastly improved audio and video quality.

Dr Raina told ENS that the world's electronic community was keenly watching the development of this new technology and several renowned foreign companies have started approaching India for manufacturing tie-ups. He said ITT of Germany, and NEC and Sony of Japan had been making attempts to develop a similar technology but were yet to succeed in bringing out a multi-standard digital TV which could be upgraded for home information systems.

The project, sponsored by the Department of Electronics (DoE), was started in September 1990, and involves nine premier institutions—the IITs at Madras, Bombay,

Delhi and Kharagpur, Indian Institute of Science, Bangalore; Electronic Research and Development College, Trivandrum; Semi Conductor Complex, Chandigarh; Associated Electronics Research Foundation, Noida, and Centre for Electronic Engineering Research Institute, Pilani. The main idea behind involving so many institutions was to make the optimum use of the expert manpower and infrastructure available.

The design was conceived in such a way that it could be upgraded and integrated with television systems like computers, teletext, telemail and video telephone.

The DoE originally estimated the cost of the three phases of the project at Rs 18 crore. Of this, Rs 2.75 crore has already been spent. Prof Raina said a programme of a similar nature in Europe and America would easily cost around Rs 40 crore. The project was conceived keeping in view future integrated communication network scenarios where the digital audio and video will play a vital role.

The project was aimed at meeting the national requirement of TV receiver production and would also enable India to enter the international market. A saving of Rs 75 crore could straightaway be anticipated in the TV industry which manufactured five million sets annually. At present, TV manufacturers here import comparable circuits from Germany, USA and Japan. But due to vagaries of supply, Indian manufacturers have never been able to truly standardise their designs. Also, these imported systems are not flexible or upgradable as the DoE systems would be.

Dr Raina hoped to come out with complete chip set using indigenous technology and system design by March 1993 with a possible tie up with foreign companies. However, no firm decision has been taken about any specific party. Meanwhile, DoE was looking for Indian industries' participation in view of the present financial crunch.

Tata, AT&T Sign Joint Production Agreement

92WT0204X Madras *THE HINDU in English*
23 Jun 92 p 12

[Text] New Delhi, June 22—AT&T and Tata Telecom Limited have signed an agreement to set up a joint venture in India to produce transmission systems for telecommunications equipment. Both parties will have an equal share in the new company's equity capital.

AT&T will provide the technological knowhow, and the plant will be situated at Gandhinagar in Gujarat. The existing plant of Tata Telecom will be expanded to accommodate the new plant. The company will be known by the name Trans India Network Systems. According to Dr. H.N. Sethna, chairman of Tata Telecom, production is expected by the first quarter of 1993.

During in the initial period, the Gandhinagar plant will function only as an assembly unit and the major components will be imported; indigenous manufacture of major components will be taken up over a period of three years, said Dr. Sethna. The market for the new venture is expected from the Mahanagar Telephone Nigam, railways and various other units in the public sector through the Department of Telecommunications.

Though there have been no specific orders up to now, the Department of Telecommunications is expected to place some orders in the near future, according to Dr. Sethna. Similarly, given the product range of the proposed plant, the market would be large, he said.

Telecom Panel Approves Alcatel Collaboration

92WT0184X Madras *THE HINDU in English*
6 May 92 p 9

[Text] New Delhi, 5 May: The Telecom Commission has approved a proposal to manufacture annually one million lines of switching equipment based on OCB 283 digital technology supplied free to the Indian Telephone Industries (ITI) by its French collaborator, C.I.T. Alcatel. The total cost of the project has been estimated at Rs. 226 crores with the requirement for the current financial year placed at Rs. 72 crores. The Government may possibly seek French official credit to meet the foreign exchange requirement of the project.

A decision of this nature implied that the Government may increasingly rely on private sector including foreign companies to manufacture the remaining but rising requirement of telephone exchanges. In a sense, the share of private sector in the overall switching equipment production is expected to exceed that of the public sector by the end of the Eighth Plan, provided the Government finalised the technology choice soon.

While clearing the proposal, the Commission has carefully considered the political as well as social implications of such a decision because of surplus labour with ITI.

Accordingly, it has decided that instead of one factory, the ITI's three units situated in Mankapur, Bangalore and Palghat will manufacture 330,000 lines each annually using OCB 283 technology. Besides, the Telecom Commission is considering a proposal to use C-DoT technology to manufacture nearly 300,000 lines at ITI's Rae Bareilly unit.

With this, it appears that the Ministry of Communication has begun to move forward to crystallise its choice of switching technology for which a committee had been set up in August last under the chairmanship of Member, Technology, in the Telecom Commission. But strangely this committee did not specify the number or name of technologies that could be allowed in India other than recounting the eleven switching technologies currently being used in the country.

Huge Gap

By the end of the Eighth Plan in 1997, India would be requiring 3.3 million telephone lines annually. While the OCB 283 technology-based units at Mankapur, Bangalore and Palghat may contribute nearly 1 million lines annually by 1994 after installation of new and balancing equipment (incidentally E 10B will be phased out from Mankapur progressively), C-DoT based technology may chip in an additional 30,000 lines from Rae Bareilly and about 200,000 lines from C-DoT licensees. This may leave a gap of 1.6 million lines to be met by the private sector for which advance action may have to be taken this year as setting up of a modern digital switching factory required about three years. It was a different matter that Mankapur and Palghat units of the ITI witnessed substantial cost and time overruns due to reasons unrelated to telecommunication.

As a wide open field is expected to be available to the private sector, the Department of Telecommunications will have to decide early on the technology choice. But this will depend on two tenders floated by DoT for the supply of two lakh lines each of cellular telephones and direct exchange lines (DEL) or the electronic switching system.

According to informed sources, while for the cellular tender, nearly 30 parties have submitted bids, the tender for two lakh DELs has attracted bids from eight companies, mostly global. The sources said, the technology choice for electronic switching system will be decided only after the two lakh DELs tender is finalised—most likely by the end of May 1992.

Question Raised

Thus, while technology choice can be expected to be in position shortly with certain inclusion of Alcatel and C-DoT the question being raised in official quarters was whether India should be made a playground for multiple technologies or should it be restricted to three. If it were to be restricted to three or so, then massive lobbying can be expected from known global giants even if it meant exclusion of their demand for operating basic telephone services. Incidentally, multinationals like Ericsson, Siemens, Motorola, AT&T etc. reportedly insisted at the time of their presentation before FIPB a favourable decision to operate telephone services besides the manufacture of switching equipment. But strangely in none of the countries like France, Germany, Sweden, United States or other parts of Europe, the number of technologies ever exceeded two or three.

Senior officials, however, felt that technology choice was not so simple that it could be put in place after DoT decided on the tender for two lakh DELs. They said unless a final decision on the Athreya Committee, which recommended break up of DoT service wing into five zonal corporation besides a Telecom Finance Corporation, was taken everything would continue to be in limbo.

According to top sources, the Telecom Commission recently circulated a draft note on the future of DoT based on the recommendation of the Athreya Committee to the Ministries of Personnel, Finance, Electronics, Planning Commission etc. It did not however give its own opinion. The Department of Personnel has rejected the idea of five zonal corporations. The Finance Ministry is yet to send its views.

Top officials in the Prime Minister's Office have reportedly suggested implementation of the Athreya Committee and allow individual zonal corporations to tie up with foreign telecom companies to promote competition. This way technology choice could also be exercised without much controversy. But officials feel the suggestion of breaking up DoT into five corporations itself may raise a new controversy which will submerge technology choice, role of private sector etc. Yet another set of officials felt that corporation to the exclusion of privatisation would be a futile exercise.

INSAT-2A Satellite Program Details Revealed

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[Excerpts]

Promise of Boom in Satellite Services

The impending launch of India's first indigenous multi-purpose communications satellite, INSAT-2A, marks the climax of two decades of effort by the Indian Space Research Organisation (ISRO) to build world class operational satellites within the country.

INSAT-2A is the most complex satellite India has developed so far. It is larger and heavier than its predecessor, the U.S.-built INSAT-1D, and has one-and-a-half times more C-band transponders, better resolution for meteorological imaging as well as an additional payload for detecting distress signals. With all that, the home-built INSAT-2A costs only half as much as its imported cousin INSAT-1D.

There is no doubt that INSAT-2A represents a landmark achievement of Indian scientific prowess. Very few satellites (if any at all) pack so much capability into a spacecraft weighing just 911 kg (without the propellants which would be consumed during the satellite's life).

Therein lies INSAT-2's strength and, ironically, its weakness as well. Its strength is its versatility and cost-effectiveness. Its weakness is that high reliability performance and every gramme of additional weight are so vital, that there is considerable dependence on imported components (not just electronics). As a consequence, INSAT-2 programme was severely affected when the U.S. recently placed a ban on exports to the ISRO. About half the electronic components which went into INSAT-2A were from the U.S. The need to redesign circuits for electronic components from alternate sources and to indigenise other critical components and materials make

it probable that the launch of INSAT-2C, scheduled for 1994-95, will be delayed. But that should not be a source of concern if INSAT-2A and 2B are both successfully launched and commissioned.

The U.S. ban, which also prohibits imports from ISRO, has been a setback to the organisation's ambitions of entering the highly lucrative world market for satellites, using its demonstrated expertise with INSAT-2 and the IRS (Indian remote sensing) satellites. India has a decisive competitive edge in the international market in areas of high technology, such as space; where wages for highly skilled manpower form a major component of the cost, observes Dr. U. R. Rao, chairman of ISRO.

The scheduled launch of INSAT-2A next week, followed by INSAT-2B next year, will double and then treble INSAT's capacities in space. If today INSAT handles about 4,000 two-way speech circuits, by the middle of this decade INSAT system could be catering to more than 17,000 two-way speech circuits. The number of transponders available to the Department of Telecommunications (DoT) is expected to increase rapidly from the existing 11 to 44 by around 1995 and for TV and radio from eight to 21. [passage omitted]

INSAT-1s succeeded in establishing the advantages of a multipurpose satellite in geostationary orbit for communications, accurate weather forecasting and storm warning, and for broadcasting TV and radio programmes. INSAT-2s will undoubtedly witness a boom in satellite services. Insufficient capacity in space, which plagued INSAT-1 after two satellites in the series failed, will, hopefully, never again be a bottleneck.

Technology Inputs for INSAT-2

At first glance, the INSAT-2 is strikingly similar to the U.S.-built INSAT-1s: there is the same box-like structure in the centre with two antennas on either side, a long solar sail with boom extending out of one end and the solar array on the other. But appearances are deceptive. Not only has INSAT-2A been wholly designed, tested and built in India, it has greater capacity than the imported INSAT-1D and several improvements have been introduced to guard against failures.

"The main design concept borrowed from INSAT-1 was the solar sail and boom to balance the solar array placed on one side alone," says Mr P. Ramachandran, the INSAT-2 project director. The infra-red sensor of the very high resolution radiometer (VHRR) (for meteorological imaging) is cooled by a highly polished cooler which radiates the heat out into cold space. Therefore, the solar array, which converts light from the Sun into electricity to drive the satellite's payloads, can be fixed only on the side opposite the cooler (otherwise it would defeat the purpose by reflecting the Sun's rays back onto the cooler). The solar sail and boom are needed on the other side to balance the pressure of the stream of charged particles emanating from the Sun and falling on the solar array.

Although other viable options were studied, the solar boom and sail approach was chosen in INSAT-2 because of its simplicity and because these had already been indigenised, says Mr. Ramachandran. But most of the technology and design methodology which went into INSAT-2 came from APPLE (Ariane Passenger Payload Experiment) and the Indian Remote Sensing (IRS) satellites, he adds.

Multipurpose Payload

Apart from the INSAT series, nowhere else in the world has a meteorology payload been put into what is essentially a communications and direct broadcasting satellite. Though this is perhaps more cost-effective, it is not without disadvantages. One, as mentioned earlier, is the imbalanced solar array. But even more important is that the stringent station-keeping requirements for the VHRR has resulted in a high momentum wheel (MW) (6,000 rpm) being needed. The angular momentum of the spinning wheels offsets minor perturbations and holds the spacecraft steady.

Few other satellites have used such MWs. Therefore the sole manufacturer of these wheels in the world, ISRO, has had limited experience with them. It hopes to have its indigenous momentum wheels ready in time for INSAT-2C. The momentum wheels on INSAT-1D have been giving trouble, though the word is that INSAT-1D should be able to last out its full life. Meanwhile, based on data received from INSAT-1D, the manufacturer has made some modifications to the wheel and these modified wheels were fitted in INSAT-2A.

One unique feature of the INSAT-2 series is the idea of having two of them co-located at one site so as to seem from the ground as one big satellite with the capacity of both together. By polarising the radio signals, the same frequencies, with a little staggering, can be used for both satellites: right-handed circular polarisation would be used for communication with one satellite and left-handed circular polarisation for the other.

Co-Located Systems

The motive behind co-locating two 1.5-tonne satellites was that the capability to put a 3-tonne satellite into a geostationary transfer orbit (GTO) would be well beyond any indigenous launch vehicle India could develop in the near future. But there are other advantages as well. Should there be a failure, it would be a smaller and cheaper satellite which would be lost. Moreover, the number of transponders can be increased gradually with growing use, rather than in big jumps. Another advantage is that the capacity available during an eclipse, when the solar array cannot function and the satellite has to be run only with onboard batteries, is greater than with two co-located satellites than with a single large satellite. Co-location will probably be carried out only with INSAT-2C or later.

The INSAT-2 design incorporates a number of fail-safe features, some of them based on the INSAT-1 experience

(two of the four INSAT-1 satellites, INSAT-1A and 1C, failed within six months of launch). There will be no partial deployment of the solar panels or deployment of the two C and S-band antennas GTO.

In INSAT-1, there was a partial deployment of the solar arrays to provide adequate power while the satellite was in GTO. After launch, the south face of INSAT-2, which has the stowed solar panels, is turned towards the Sun. The INSAT-2 solar panels are larger and the outermost one is sufficient for the power needs in GTO.

The INSAT-1 solar array had a complicated multi-axial deployment for its panels. INSAT-2 has a simpler system, with the T-shaped arrays, consisting of three full panels and two half panels, unfolding like an accordion, a method used very successfully in the IRS satellites as well. Nor is there any need in INSAT-2 for the deployment of antennas while in the transfer orbit. In INSAT-1, one of the folded antennas covered the apogee boost motor which could not be fired until the former was deployed. (In fact, in INSAT-1A when this antenna refused to deploy the apogee boost motor was fired briefly to open it out!)

In INSAT-2, the apogee boost motor is on the face away from the Earth (the anti-Earth face, as it is called) and is unhindered by any structures. Another precaution that has been taken in INSAT-2 is to have a fixed antenna facing the Earth so that even if one of the antennas fail to deploy, at least half the payload capacity can be operated. Had one of INSAT-1's antennas failed to deploy, the satellite would have been rendered useless.

Some thrusters (small rocket motors used for attitude and orbit correction) are covered by the folded solar panels of INSAT-2. To compensate, there are four extra thrusters on the anti-Earth face, located as a pair on either side of the apogee boost motor. Should for any reason the apogee motor fail to fire, these four thrusters can be used to reach the geostationary orbit, although extra propellant will be consumed and the satellite life reduced by three vital years.

The INSAT-1 series used travelling wave tube amplifiers (TWTAs) for output signal amplification. INSAT-2s use solid state power amplifiers (SSPAs), which consume less power, are harder and have longer life, for all its C-band transponders. The four watt SSPAs are supplied by Hindustan Aeronautics Ltd. (HAL) while the eight watt SSPAs were imported.

The TWTAs have had to be retained for the two high-power S-band transponders used primarily by Doordarshan. However, as these TWTAs are made by a lone American company, the U.S. ban on exports to the ISRO brings into question the continuation of the S-band beyond INSAT-2B. (In that case, Doordarshan can use the C-band for networking its national and regional programmes after the year 2000 when INSAT-2B's life ends.)

Weak spots in Indian industry have led to considerable dependence on imports. The dependence is most (and possibilities for reducing it are least) in electronic components. An operational geostationary satellite needs radiation hardened integrated circuits (ICs), or expend weight on metallic shielding with ordinary ICs, to withstand the high radiation levels in outer space. Other components like solar cells for the solar arrays, sensors and the highly polished beryllium mirror for the VHRR, cells for the nickel cadmium batteries, and thermal blankets to maintain the satellite's temperature regime have to be imported as well.

Propellant Tanks

Another area of imports is that of light weight, high precision and high reliability parts. An example of this is the tanks which hold the propellants for the apogee boost motor and thrusters. These tanks have to be machined from a single titanium forging. At some points on its surface, the tank will be only 0.6 mm thick and yet will have to withstand high pressures (20-25 bar). To complicate matters, the tanks need to have internal flanges so that propellants are available at the exit piping when needed, instead of floating away as would happen under zero gravity conditions.

MBB of Germany supplied the tanks needed for INSAT-2A and 2B. According to reliable sources, MBB has also provided the technology needed for their manufacture in India. The surprising fact is not that such imports have been necessary but that so much indigenisation was possible to begin with. The VHRR was almost wholly indigenous, except for a few components. The imported VHRR which went into INSAT-1s cost about Rs. 10 crores, while INSAT-2A's indigenous one cost just Rs. 2 crores. Back in 1984-85, foreign companies were asking about Rs. 10 crores for the VHRR sun-shield which is made of optically finished aluminium. Ultimately, with the help of organisations like the National Aeronautical Laboratory (NAL) and Indian Institute of Astrophysics, it was indigenously fabricated at a fraction of that cost.

INSAT-2 is equipped with indigenously designed, manufactured and dynamically tuned gyroscopes to detect changes in the spacecraft's orientation. The information is fed to the attitude and orbit control electronics (AOCE) which is programmed to decide what corrections are needed and how these are to be carried out. The gyroscopes simplify operations to move the satellite from the transfer orbit to geostationary orbit. Immediately after injection into transfer orbit, the Sun and Earth sensors—both indigenous—are used to orient the satellite precisely. These sensors also provide an additional check on the satellite's orientation and can be used to correct the gyros.

The indigenously developed AOCE has a 16-bit microprocessor. The INSAT-2 AOCE is different from that of INSAT-1. The IRS-1A and 1B, now in orbit, use hard-wired systems, and a microprocessor-based system will be introduced only with the IRS-1C slated for launch

next year. To lighten the spacecraft, the AOCE has a motherboard with daughterboards plugging into it, rather than have separate printed circuit boards connected by (hard) wiring.

Wholly Indian Design

Components may have had to be imported, but the entire design and fabrication of the communication payload was carried out in India. Again, the carbon fibre antennas, each of which would have cost Rs. 10 crores if imported, were made within the country at a cost of only Rs. 8-10 lakh. Although the solar cells are imported, they are made into panels mounted on light weight high strength carbon fibre substrates by the ISRO.

The bipropellant apogee boost motor, an item covered by the Missile Technology Control Regime (MTCR) and which only three or four companies in the world make, was developed at the ISRO. In INSAT-2A, 10 thrusters (small rocket motors used to correct the satellite's orientation and orbit) are from a U.S. company and six thrusters developed indigenously. In INSAT-2B, half the thrusters will be indigenous and half imported, and all the thrusters in INSAT-2C will be indigenous.

A small but important component which has been successfully indigenised is the solar array drive assembly (SADA). This drive rotates the solar array to keep it at the best possible angle to the Sun so that maximum energy is generated.

India being able to indigenously design and build so complex a satellite as INSAT-2A is no mean feat, its import content notwithstanding. Outside the closed circle of the developed world and Russia, no other country has demonstrated the capability to develop such satellites. Although China is well ahead of India in launch vehicle capability, the indications are that they are lagging behind in satellites. But, to be fair to the Chinese, the emphasis in their space programme has hitherto been on scrupulously avoiding dependence on other countries (which has not always been ISRO's top priority).

Deployment of INSAT

The launch time has been fixed so that maximum power can be generated by the satellite's solar arrays and to get sufficient data from the Earth sensor to calibrate onboard gyroscopes. Nineteen minutes after lift-off, the Ariane launch vehicle will place INSAT-2A in an elliptical geostationary transfer orbit with a perigee (distance closest to Earth) of 200 km and apogee (distance farthest from Earth) of 35,976 km. The launch vehicle will position the satellite in the desired orientation and separate it in the three-axis stabilised state. Ten minutes

later, the satellite will be within radio reach of the master control facility (MCF) at Hassan in Karnataka. All operations and manoeuvres on the INSAT satellites, including round-the-clock monitoring of the satellite's health, moving it from the transfer orbit to its allotted slot in geostationary orbit and thereafter ensuring that it is maintained in position is carried out from MCF which has been augmented to handle INSAT-2s. The onboard Sun and Earth sensors are used so that the satellite is properly oriented. Unlike in INSAT-1, there is no partial deployment of the solar arrays in transfer orbit. Instead for most part of the time in geostationary transfer orbit, the satellite's south face, with the solar arrays folded, is pointed towards the Sun. The Earth view (EV) face is directed towards Earth. Data from the Sun and Earth sensors are used to calibrate the gyroscopes.

INSAT-2A's onboard liquid apogee motor (LAM) will provide the incremental velocity needed to convert its elliptical orbit into a circular geostationary orbit. During the firing of the apogee motor, the satellite's orientation is changed so that the LAM is at a tangent to the orbit rather than facing away from Earth. The north face (on which are the folded solar sail and boom) will then be pointing towards Earth. The 3-axis attitude information can be provided by the gyroscopes. Alternatively, the satellite's pitch and roll can be derived from the Earth sensor.

The LAM is fired thrice, each time while the satellite is at the apogee. With the additional velocity, the satellite's perigee increases until after the last firing it is in a near synchronous orbit. The satellite therefore passes through two intermediate orbits between the transfer orbit and the final one after two revolutions in the second intermediate orbit. The third apogee motor firing (AMF-3) would last for just 3.5 minutes. The spacecraft will then enter the drift orbit when it will float to its final location at 74 degrees E longitude. There some trim manoeuvres, using the satellite's thrusters, would be carried out.

The solar array will be deployed in the near synchronous orbit itself. The two C- and S-band deployable antennas as well as the solar boom will be fanned out and the momentum wheels spun. After that the C-band, extended C-band, and S-band transponders and the meteorological payload are turned on.

Modest Beginnings With APPLE

Growth of Indian capabilities in satellite development has been extremely rapid. Only 15 years ago, the first Indian satellite, Aryabhata, weighing a mere 360 kg was put into orbit from Soviet Union. Today, the ISRO is ready with the first of the complex 1.9 tonne INSAT-2 satellites.

India's Indigenous Satellites

Satellite	Weight	Launch Date	Launched By
Aryabhata	360	April 1975	Intercosmos rocket, U.S.S.R.
Bhaskara-I	444	June 1979	Intercosmos
Rohini	35	August 1979	SLV-3, India*
Rohini	35	July 1980	SLV-3
Rohini	32	May 1981	SLV-3
APPLE	650	June 1981	Ariane test launch
Bhaskara-II	436	November 1981	Intercosmos rocket, U.S.S.R.
Rohini	41.5	April 1983	SLV-3
SROSS	150	March 1987	ASLV, India*
IRS-1A	975	March 1988	Vostok launcher, U.S.S.R.
SROSS	150	July 1988	ASLV*
IRS-1B	975	August 1991	Vostok launcher, U.S.S.R.
SROSS	106	May 1992	ASLV

*Indicates launch failures

In fact, it is from APPLE (Ariane Passenger Payload Experiment), rather than its predecessor INSAT-1s, which were designed and built abroad, that the indigenous INSAT-2 series draws its heritage. "We learnt an enormous amount from APPLE," points out Mr. M. G. Chandrasekhar, ISRO's scientific secretary. INSAT-2, he says, was built on a combination of experience from APPLE and technology from India's own remote sensing satellites, the IRS series. India got the opportunity to put the 650 kg experimental communications satellite into geostationary orbit in June 1981 when the European Space Agency (ESA) offered free launches on the first few test flights of the Ariane launch vehicle.

APPLE was a three-axis stabilised spacecraft when there were not many such satellites in orbit. ISRO's previous satellites (Aryabhata, Bhaskara-I and Bhaskara-II) as well as many operational communications satellites of the time were spin-stabilised; that is, they spun round their axis, similar to the way a bullet is spun by rifling in the barrel of the gun to hold it on a steady trajectory.

Three axis stabilisation is a much more complex affair. Momentum wheels are used to offset minor perturbations and hold the satellite steady. In APPLE, one momentum wheel was indigenous while the other was imported. Sun and Earth sensors—one set indigenous and the other imported—and not gyroscopes were used in APPLE to monitor the satellite's orientation. There was no onboard computer to decide what corrections were needed and instead these computations were carried out on ground and transmitted any corrections

needed. The thrusters (small rocket engines) used for making these corrections were imported. The APPLE's graphite antenna and its two C-band transponders were developed in India. In fact, the same graphite antenna has been used as the fixed antenna in the INSAT-2 series. The solid apogee boost motor, derived from SLV-3's fourth stage, was made within the country. APPLE gave ISRO scientists their first experience in manoeuvring a satellite from the transfer orbit to its allotted slot in geostationary orbit and in maintaining it in position thereafter. (INSAT-1A was launched only a year later.)

APPLE was equipped with two C-band transponders. Trials were carried out with various communications techniques like time division multiple access where a number of Earth stations use the satellite, with each station being given brief time slots for access which recur frequently. Some applications were also tried out, such as point to point voice and teleprinter communication, small communication terminals, and use of such satellites for computer data communication. The trial facsimile transmission of THE HINDU's composed pages was among the experiments tried using APPLE.

Expanded Capabilities for Telecommunications

As in INSAT-1s, INSAT-2s will have 12 normal C-band transponders for telecommunications. As of December 1991, INSAT-1D was supporting 126 telecommunications terminals of various sizes, providing 4,514 two-way speech circuits. (THE HINDU transmits its pages composed at Madras by facsimile over the INSAT link to Delhi for printing.) The Department of Telecommunications (DoT) is establishing 50 Earth stations in the North-East for a rural telegraphy network. The National Information Centre (NIC) has more than 450 microterminals on its network NICNET and plans to have one network microterminal at every district headquarters across the country.

INSAT-2S will have six transponders in the extended C-band which INSAT-1s lacked. Two of the extended C-band transponders are of higher power and DoT wants to use these to improve business communications using very small aperture terminals (VSATs). This network would be of use to large organisations with far-flung and rural operations.

The DoT already has a rural area business message network (RABMN) which operates in the normal C-band. With transmission speeds of 1.2 kilobits per second (kbps), it is suitable for teleprinter links and computer data transfer, but cannot support voice transmission. The extended C-band VSATs would permit transmission rates of 64 kbps or more and hence be capable of voice transmission as well (though systems for this purpose are probably yet to be designed). Around 1,024 organisations have registered for the RABMN microstations and 101 have already been supplied with it.

Extended C-band has an additional advantage over the normal C-band in that it is less susceptible to interference as there are not many terrestrial systems operating in this band. As a result, VSATs can operate even from city centres, instead of being restricted to rural areas alone. In fact, for this reason, DoT could itself use the extended C-band to route its inter-city calls from city centre to city centre, instead of through Earth stations away from the city.

Whether they use normal or extended C-band for the purpose, business organisations will need VSATs. These are miniature Earth stations capable of beaming data to satellites and receiving transmitted data, with the satellite acting as a relay between VSATs. The VSATs have a dish of diameter between 4-6 feet (the ubiquitous rooftop dishes to receive Star-TV are eight feet or more across). But VSATs do not come cheap. A VSAT suitable for RABMN can cost about Rs 7 lakhs.

There is no doubt that there would be plenty of demand for such fast and reliable business communication links. But the cost of VSATs could be a deterrent to their spread. Although globally the power sector is one of the largest users of such satellite services, the National Thermal Power Corporation (NTPC) has only seven earth stations at present. The Railways, with its far-flung operations, has none.

The extended C-band transponders can be used for expanding regional TV services. Even now, Doordarshan is using the normal C-band for distributing regional TV broadcasts in Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu, West Bengal and Orissa (the national programmes are transmitted in S-band). The Doordarshan has established a country-wide chain of 500 low power transmitters, in addition to the much more expensive high power transmitters in cities, which receive these transmissions from the satellite and then rebroadcast them on the standard TV frequency. At the time of INSAT-1 configuration, it was decided that there should be two high-power S-band transponders so that relatively cheap direct reception TV sets (capable of picking up the broadcasts straight from the satellite) could be installed in villages.

Since more S-band transponders will become available with the launch of INSAT-2A and 2B, All India Radio (AIR) can increase its use of the satellite. At present, it is using only six channels in the S-band to network its radio stations and this could quickly rise up to 30 channels.

The National Physical Laboratory (NPL), Delhi, provides a round-the-clock standard time and frequency signal on the S-band which can be received on a system with a 2.44 metre chicken-mesh antenna, a converter, FM demodulator and a microprocessor-controlled signal decoder. The Press Trust of India (PTI) utilises the S-band to transmit news and photographs at higher speed to users across the country.

The technology for economical direct reception of C-band TV broadcasts became available only in the mid-1980s. It is this technology which makes it possible for cable TV operators to provide Star-TV (which uses C-band) to their viewers. Since Doordarshan's regional TV broadcasts also use C-band, cable TV operators are able to provide these programmes too in other states. But the satellite dish and electronics for direct reception of C-band TV costs over Rs 20,000 compared to Rs 7,000-10,000 for the S-band. There are an estimated one lakh direct reception TV sets for both C- and S-band in the country.

The launch of INSAT-2A and then of 2B will provide enough spare C-band capacity to consider introducing entirely new services, like teleconferencing (though a Governmental policy decision would be necessary for this), which were not possible as long as there was only one INSAT in orbit. Satellite news gathering (SNG) is another possibility. Portable and mobile SNG terminals for TV and radio have been already successfully tested.

An Eye on Weather

Weather forecasting in India took a quantum leap forward with the advent of INSAT-1S. INSAT's very high resolution radiometer (VHRR) provides the satellite photographs of cloud cover over Earth which appear in the daily TV weather reports and in many newspapers. These cloud cover pictures are taken at least once every three hours, and more frequently if needed. They are taken in the visible and infra-red bands during the day and in the infra-red alone at night.

The cloud imageries, together with the information they provide about winds in the upper atmosphere, the sea surface temperature, precipitation and out-going long-wave radiation, are used by the Indian Meteorological Department for routine weather forecasts as well as for developing weather prediction models. The imageries help in tracking cloud systems over the oceans where no other observational data is possible, and make it possible to lend out sufficiently early warnings about approaching cyclones and sudden storm surges.

Informing Neighbours

The infra-red picture of Earth taken every day at 8.30 a.m. is transmitted by radio facsimile for the benefit of neighbouring countries. Information about wind streams in the upper atmosphere estimated from VHRR imageries are fed to the global telecommunications system of the World Meteorological Organisation and can be accessed quickly by any country for weather forecasting.

The resolution of INSAT-2's VHRR has been improved to two km in the visible band (it was 2.75 km in INSAT-1) and eight km in the infra-red (from 11 km in INSAT-1). INSAT-2A's VHRR is almost wholly indigenous. As with INSAT-1, INSAT-2 series too will have a data relay transponder to pass on meteorological, hydrological and oceanographic data collected by unmanned automatic data collection platforms located in remote

and uninhabited places to the Meteorological Data Utilisation Centre at Delhi. There are plans to remove the VHRR in INSAT-2C and substitute it with a Ku-band payload. With INSAT-2A and 2B in orbit, there would be two VHRRs available and there would be no need to send up a third immediately. The wider Ku-band would allow higher transmission rates and be suitable for high-speed computer-to-computer digital transmission. The satellite dishes can be quite small and be placed anywhere without fear of interference from other radio sources. The National Informatics Centre (NIC) is said to be eager for a Ku-band; in fact, it has reportedly been arguing for a Ka-band of still higher frequency.

INSAT Search and Rescue

INSAT-2A carries, for the first time, a transponder to detect distress signals of the COSPAS-SARSAT system. COSPAS-SARSAT is an international satellite-aided search and rescue programme. When an emergency radio beacon carried by aircraft, ships and even groups on land (such as mountaineers) emits a distress signal, this signal is picked up by one of the four polar orbiting satellites and passed on to a local user terminal (LUT). In India, there is an LUT at Bangalore and Lucknow. This sets the rescue effort in motion. The frequency change (because of the Doppler effect) as a result of the satellite's motion makes it possible to locate where the distress signal is emanating from.

The advantage of having an emergency detection system in geostationary orbit is that it can alert the LUTs as soon as an emergency occurs. Even with four satellites in low earth orbit (LEO), there could be a delay of 1.5 to three hours near the equator between an emergency radio beacon being activated and its detection. This delay can obviously be critical in many emergencies. Use of geostationary orbit-based detection is still experimental globally and, if proven, INSAT-2s will be the only satellites in the Indian Ocean region equipped with the facility.

Cyclone Warning

Around 100 disaster warning systems (DWSs) have been installed in villages in cyclone-prone areas of Andhra Pradesh and Tamil Nadu. When the Cyclone Warning Centre at Madras detects one heading for mainland, it uses INSAT to selectively activate the DWSs in villages lying in the path of the storm. The DWS is a simple direct reception device. When it receives the right coded signal via the INSAT satellite—the code decides which DWSs should be activated—the DWS emits a siren for one minute. The system also has a public address speaker so that an announcer at the Cyclone Warning Centre can inform the people when the storm is expected to hit them and what action to take. Since the DWSs are usually located in the premises of local administrative units (the block development office or the panchayat building), local administrations are also readied for emergency action.

In 1990, the DWSs aided the speedy evacuation of more than 1.7 million people from the coastal villages of Andhra Pradesh to specially constructed storm-shelters restricting the loss of human lives to just about a dozen when the cyclone did actually hit. This service has proved so effective that it is to be expanded with another 100 DWSs being installed in Orissa and West Bengal on the east coast and Gujarat and Maharashtra on the west coast within the INSAT-2 time frame. After the last cyclone which caused enormous loss of life in Bangladesh, India reportedly offered the same service to that country. Since cyclones in the Bay of Bengal are tracked by the Cyclone Warning Centre, Bangladesh need only install the DWSs (which cost well below Rs. 1 lakh each) in its coastal villages.

Pre-Launch Tests for INSAT

Development of a satellite is a long drawn out process, with a good deal of time and money spent on a whole battery of tests. In a satellite like the INSAT-2, reliability is everything, says Dr. R. Kasturirangan, director of the ISRO Satellite Centre in Bangalore. An operational satellite has to serve continuously with no hiccups throughout its life in space.

Full Scale Model in the Testing Chamber

Before the INSAT-2 design was frozen and the flight version built, two full-scale models were built and extensively tested. These models were subjected to a whole range of tests where the parameters were often one-and-a-half to two times more than the satellite was likely to encounter in reality. These tests took more than four years. By contrast, the fabrication, integration and testing of the flight model was completed in about half that time.

As the satellite programme progressed, various test facilities have also been built. During the development of the APPLE (Ariane Passenger Payload Experiment), the country's first experimental communications satellite, half the project expenditure went towards establishing facilities, primarily in thermovac chamber where a satellite can be placed in thermal and vacuum conditions of outer space.

The INSAT-2 project has seen the large space simulation chamber (LSSC) commissioned and used at the Satellite Centre. The facility can test satellites four metres across and five metres high, larger than any satellite ISRO is likely to build in the near future. The facility can expose a satellite to very low temperatures (close to -173°C), provide hard vacuum conditions (hundred thousandth of a millibar) and simulate solar radiation too. Only about half a dozen such facilities exist in the world over. The completion of this facility allows all tests required for the development of a satellite to be carried out within the country.

A test in the LSSC can last 25 days and cost about Rs. 3 crores. (Of course, the use of a facility abroad would cost several times that amount and that too in foreign

exchange; to say nothing of the inconvenience and expense of transporting the satellite model.)

Creating the Right Conditions

One of the tests carried out in the LSSC was the thermal balance of the satellite. It can heat up if it is directly exposed to the Sun's rays up in orbit. Contributing to this, the Earth too reflects infrared radiation. Not to mention the internal heat generated by the satellite's electronics. At the same time, the temperature of the clear black sky of outer space is very low (around -270°C). So any part of the satellite shielded or turned away from the Sun, Earth and Moon will be extremely cold.

In the face of these extreme conditions, the electronics have to be maintained between 0-50°C, 5-25°C for the batteries and the reaction control system, and the VHRR detector has to be at -168°C. It is particularly important to check whether there are any hot spots in the satellite. Extensive use is made of thermal blankets which are made of multiple layers of aluminised polymer. They are good insulators and prevent heat from either easily getting in or getting out.

Optical solar reflectors (OSRs) are vital in maintaining the satellite's thermal balance. These reflectors have special coating so that heat from within the satellite is radiated out to cold space while minimising solar absorption. Although the OSRs for INSAT-2A have been imported, the technology for their indigenous manufacture has already been developed by the ISRO.

The LSSC makes it possible to monitor the satellite's performance with different lighting conditions as the Sun's position changes while the satellite is in geostationary transfer orbit and in its final geostationary slot. In the chamber, the Sun is kept fixed while the satellite is rotated on any of the three axis using a motion simulator. In geostationary orbit, the satellite will have to face eclipses lasting 72 minutes twice a year.

"Shake-up" Tests

Another example of the elaborate tests satellites go through is one which checks their ability to withstand acoustic vibrations. The satellites have to face large acoustic vibrations during their launch. In tests, the INSAT-2 structural model and subsequently the flight version were put through acoustic levels in the range 142-148 decibels. As a reference point, a modern jet aircraft taking off creates 85 decibels. With funding from the ISRO, the National Aeronautical Laboratory (NAL) established the Acoustic Test Facility (see THE HINDU, March 25, 1992) where such investigations are carried out.

The structural model of the INSAT-2 was put to mechanical tests (including vibration) and others to check the thermal balance. Almost in parallel, the electrical thermal model was tested for electromagnetic interference and electrical compatibility, and the actual heat

generated and its dissipation. It was the electrical thermal model which went through the solar simulation test.

Prospects of an Indian Launch

Both the INSAT-2s, 2A and 2B, will be put into orbit by an Ariane-4 launch vehicle, the 2B launch scheduled sometime next year. It is only when the geostationary satellite launch vehicle (GSLV) is ready that the country will have the indigenous capability to place INSATs in orbit.

But the GSLV that can put an INSAT-2 class into orbit—about two tonnes into geostationary transfer orbit—needs a cryogenic stage whose highly efficient engine would run on liquid oxygen and liquid hydrogen. (It was the contract with the Russians for the supply of the engine and technology for its manufacture which the U.S. took exception to on the grounds that it violated the Missile Technology Control Regime or the MTCR.)

U.S. Ban

When India and Russia refused to break the contract, the U.S. placed import and export bans on the space agencies of both countries, the ISRO and Glavkosmos. So far, implementation of the contract is reportedly going ahead as scheduled. But given the geo-political imperatives acting on both India and Russia, particularly their growing reliance on American help in various areas, it is well within the realms of probability that the contract will sooner or later be terminated. Until ISRO has got the cryogenic engine in hand, it would certainly be unwise to take its transfer for granted.

What happens if the contract is terminated? India has the scientific capability to indigenously develop the cryogenic engine. But it would take time (about 5-8 years) and money (at least twice the Rs 270 crores that Russians have asked). But in the meantime, India has a number of sensible options it can exercise with the technology it already has on hand. The GSLV is derived from the polar satellite launch vehicle (PSLV) scheduled to be launched next year. The PSLV's solid first stage (it is one of the world's largest solid motors) and the second liquid stage using the Vikas engine (derived from the French Viking) are both retained without change. Instead of PSLV's six solid propellant strap-ons, the GSLV would have four liquid propellant strap-ons using the Vikas engine. The PSLV's solid third stage and liquid fourth stage would be replaced by a single cryogenic stage in the GSLV. It is the configuration which can put two tonnes into geostationary transfer orbit (GTO).

What if the cryogenic engines do not come through? One option is to retain the PSLV core stages exactly as they are, and by substituting four liquid propellant strap-ons (for the six solid strap-ons) and slightly uprating the fourth liquid stage, get a GSLV capable of putting about 1,200 kg in GTO. A second option would be to replace the third and fourth stages also with a single liquid stage powered by an uprated Vikas engine, to enable a 1.5

tonne satellite to be put into the transfer orbit. The first option—the latter option is virtually an entirely new launch vehicle—has the advantage that only the liquid strap-ons have to be developed, saving on time and cost.

Dedicated Satellites

"A powerful communications satellite can be built even with the 1.2 tonne capability. The casualty will be INSAT-2's multi-payload capability, combining communications, direct broadcasting and meteorological monitoring.

"The time has come to separate the meteorological Earth observation functions from INSAT and build the required communication and meteorological satellites as separate, optimised satellites that will be required to follow after the launch and operationalisation of the remaining four INSAT-2 satellites," pointed out Mr Promod Kale, director of Space Applications Centre, Ahmedabad, at a symposium to mark 100 months of INSAT-1B. INSAT-2's communication payloads were designed and fabricated at the Centre.

The INSAT-1 configuration of combining these payloads arose as a way of selling the idea of a geostationary satellite to the Government at a time when its user departments (communications, information and broadcasting, and meteorology) were unconvinced about its utility. Now that the INSAT-1 series has successfully established the need for such satellites, it is possible to think in terms of having separate communications and meteorology satellites.

If meteorology was removed from INSAT-type satellites, the need for such stringent station-keeping would be reduced. Without the very high resolution radiometer (VHRR) for meteorological imaging, it would be possible to have solar arrays on both sides, instead of the existing asymmetric ones. This should save weight which can be used for the payloads, improve the satellite's stability, and by having independently driven sun-tracking solar arrays on both sides, increase power availability as well.

With INSAT-2, two co-located satellites are needed to get 36 C-band transponders (12 in normal C-band and 6 in extended C-band). And co-location has its problems, including the need for high accuracy yaw maintenance. With a dedicated communication satellite, all this capacity can be provided by a single satellite.

A meteorological satellite can be probably made with a mass of around 600 kg which even the PSLV, with little or no modification, would be able to put into GTO. The orbiting METEOSAT weighed 681 kg at launch and Japan's Geostationary Meteorological Satellite, 725 kg.

There is no reason to have VHRR in every INSAT satellite. In fact, there are plans to remove it from INSAT-2C and introduce the Ku-band for roof-top communications, making it a wholly communications satellite. Since the U.S. ban means that the sole American company making the necessary travelling wave tube

amplifiers will not be able to supply them to ISRO, INSAT-2C may be without the S-band too. In place of the S-band, there may be increased transponders for C- and Ku-band. Television and radio, which are now using S-band, can use C-band for their networking needs.

Future Plans

It is also necessary to consider future areas of growth where commercial opportunities lie. The L-band, for instance, can be used for land mobile, air mobile and maritime communications. Spare capacity on Indian communication satellites can be given to other users at a price. To do so, it would be necessary to provide "on-orbit" capability to point the antenna beams at some new location.

Perhaps no less important, a fairly powerful communication satellite can be developed with a mass of around 1,200 kg which would be within the capability of a non-cryogenic GSLV. ASIASEAT, the satellite through whose agency viewers in India get Star-TV, weighed 1,244 kg at launch and has 24 C-band transponders. But, denied access to high-quality U.S. electronic components, India may not be in a position to build such weight-efficient satellites. It can, however, certainly develop a satellite with 18 to 20 C-transponders—thus at least equalling the C-band capacity of INSAT-2A—within 1,200 kg.

The ISRO Chairman, Dr U. R. Rao, has been speaking of a 1,200 kg class direct broadcasting satellite called GRAMSAT dedicated to rural education. It would have six to eight high power C-band transponders with video compression techniques! Addition of two or three very high power spot-beam Ku-band transponders would permit direct reception with an antenna less than three feet across. Work on defining INSAT-3, which would follow on from INSAT-2, is still in progress.

The greatest threat to the future of the country's future communication satellites comes not from the possible inadequacies of the GSLV, but from the U.S. ban on ISRO which bars India from purchasing radiation hardened integrated circuits from America. The INSAT-2 series may not be affected if ISRO has sufficient radiation hardened ICs imported before the ban. Even if the Russian deal falls through, indigenous development of cryogenic technology is still a viable option. But India is so far behind in microprocessor technology that it would not be practical to depend on indigenous development for the radiation hardened devices needed by communication satellites.

The process for manufacture of radiation-hardened ICs is different from that of conventional ICs. It is a technology India does not possess at the moment but can probably develop. Even then, India may be able to make only the simpler ICs. Outside the U.S., Thompson-CSF of France does make radiation-hardened ICs. Their range of ICs is said to be quite limited compared to that available from U.S. The option of using conventional

ICs with metal shielding to protect them from radiation, quite apart from the weight penalty, may not provide the reliability needed.

World's Second Largest Radar Installed

92WT0182X New Delhi *PATRIOT* in English 8 May 92 p 6

[Text] Bombay, 7 May (UNI): The Indian MST Radar, being installed at Gadanki, a small hamlet, 30 km from Tirupati is projected to become a versatile ground tool for atmospheric research in the years to come.

This is the world's second largest such radar (the first being in Peru) and the first of its kind in India.

Gadanki was chosen for setting up of this MST (Mesosphere Stratosphere and Troposphere) Radar facility because of its geographic location as well as low level noise prevalence.

Besides, it is nearer to Sriharikota, the launch pad of the Indian Space Research Organisation (ISRO), which can also benefit from the data obtained by this radar.

According to Dr. P.G. Nair, a senior scientist of the Society for Applied Microwave Electronics Engineering and Research (SAMEER), the first phase of this radar (St. mode) has been operational for some time. Tirupati is swarming with scientist pilgrims to see this radar facility, he added. The Indian MST Radar System has been designed by scientists of SAMEER, R and D laboratory of the Department of Electronics.

The concept was implemented phase-wise, allowing the scientists to use the radar even during installation. This also helps in slight modifications in the system to mould it to satisfy the needs of user scientists, Dr. Nair said.

Dr. Nair said that during the past few years, the international scientific community had identified middle atmospheric studies as an important branch of geophysics. It is of great interest for scientists to carefully investigate the motions of the middle atmosphere on all temporal and spatial scales. MST corresponds to three height regions of atmosphere, 50-86 km., 17-50 km. and 0-17 km. respectively. Above these is the popular Ionosphere.

A radar which is used to study the dynamics of the above heights is called MST radar he explained. Rockets and balloons are used for probing the atmosphere. Different sensors sent up with these devices into the atmosphere can be analysed on a continuous basis every day by the MST radar.

In normal radars, the target may be air planes. For a MST radar the target is the irregularities in the radio refractive index of the atmosphere.

Progress in Satellite Development Noted

92WT0186X Bombay *THE TIMES OF INDIA* in English 15 May 92 p 9

[Text] Bombay, 14 May: The much-awaited maiden flight of the polar satellite launch vehicle (PSLV) is expected to take place by March 1993.

Announcing this here yesterday, ISRO officials said that an important milestone in the PSLV project was achieved yesterday with the successful testing of the third stage motor at Sriharikota.

The motor was ignited under simulated high altitude conditions and was designed and developed by ISRO utilising indigenous components and technology.

ISRO officials further stated that the third stage of the PSLV was one of the largest upper stage motors in the world.

Another important milestone in the PSLV project was achieved a few days ago with the successful testing of the liquid propulsion fourth stage engine under high vacuum conditions for 530 seconds.

The PSLV is designed for launching a 1,000 kilogram class remote sensing satellite into a 900 kilometer polar sun-synchronous orbit.

The launch vehicle comprises four stage, which measure 44 meters, weighing 275 tonnes. ISRO has made substantial progress in the last few months in completing the complex qualification sub-systems.

The Indian remote sensing satellite (IRS-IE) to be launched on board the first development flight of the PSLV is now in the final stages of integration. It will incorporate a payload from Germany, according to ISRO.

As a part of the PSLV programme the launch control and the mission control center at Sriharikota have been commissioned. Meanwhile, according to the performance budget of the department of space the IRS- IE would be subjected to a series of environmental tests.

Success, Problems of SROSS-C Satellite Noted

First Data Received

92WT0183X Bombay *THE TIMES OF INDIA* in English 23 May 92 p 8

[Text] New Delhi, 22 May: The SROSS-C satellite, launched by the augmented satellite vehicle (ASLV) on Wednesday is performing well, and the first set of scientific data on the ionosphere was received at 7:30 p.m. last night.

Indian scientists are negotiating with the space agencies of the U.S., Germany and Japan to retrieve more data from the satellite as it passes over their tracking stations during its 15 orbits around the earth daily.

The indigenously-built satellite has a retarding potential analyser (RPA), an instrument which will measure the fluctuations in the number of electrons (negatively charged particles that make up matter) in the crucial region of the earth's atmosphere called ionosphere situated at nearly 350 km. from the surface.

The second payload on the satellite, a Gamma ray burst analyser, is yet to be switched on as it requires more power at a high voltage. The batteries on board will take some more time to have the required power generated by the solar panels. It may take a few more days.

This region of the atmosphere plays a crucial role in the transmission of radio signals across continents. Though global transmission of radio, television and data signals are now done using geostationary satellites located at over 36,000 km. from the earth's surface, ionospheric transmission is kept as a back-up facility.

Dr. B.M. Reddy, who heads the ionosphere study group at the National Physical Laboratory here where the RPA was designed and built, said data from the equipment on board the satellite will help provide a better understanding of the region.

The results could be used to improve communication methods, especially to identify favourable frequencies and time for efficient, cost-efficient, distortion-free transmission. The satellite equipment takes readings continuously. However, the satellite will pass over the range of India's tracking stations only for about 22 minutes, that too only three times a day, and the data for only these periods would be available to the scientists.

As the satellite is not expected to be operational for more than five or six months (it drifts away from the orbit due to gravity), scientists are eager to make full use of the opportunity.

To make a comprehensive study of the atmosphere, Indian scientists are also planning to launch two or three Rohini series sounding rockets which go up to 320 km. from the earth's surface.

Circular Orbit Not Achieved

92WT0183Y Madras THE HINDU in English
26 May 92 p 6

[Text] Thiruvananthapuram, 25 May: Despite the "slightly elliptical orbit" that the SROSS-C satellite was placed in by the ASLV, the satellite will have a life exceeding the 100 days intended for it, the ISRO Chairman, Dr. U.R. Rao, told a press conference here today.

Though the ASLV was supposed to put the SROSS satellite in a near circular orbit about 450 km. above the earth, the satellite has been put in an elliptical orbit with an apogee of 440 km. and perigee of 290 km. ASLV-D3's closed loop guidance system had worked so well that the launch vehicle had "closely hugged" the intended trajectory till the end of the third stage when the guidance

system too was jettisoned. The reasons for the failure to achieve the desired orbit were being studied, Dr. Rao said.

The satellite's second payload to study gamma ray bursts would be switched on Wednesday. The spin rate was deliberately brought down from 80 rpm to five rpm using passive measures to meet the requirements of payload operation.

Priority for PSLV: With the success of ASLV, top priority would be given to the Polar Satellite Launch Vehicle (PSLV) which could place a one-tonne IRS (Indian Remote Sensing satellite) in a 900 km. polar orbit. "We are pushing to launch the PSLV before the year end and definitely before next March," Dr. Rao said. The PSLV would make three flights before its first operational flight to put the IRS-1D in orbit in 1995-96. The IRS-1C would be launched abroad in 1994.

Dr. Rao reiterated that the contract with the Russians for purchase of cryogenic engines and technology was proceeding without hitch and according to schedule. The progress of the project was being monitored on a weekly basis, he said.

Through indigenous effort a one-tonne pressure fed cryogenic engine had been built and tested. But it would take another eight to 10 years to develop indigenously a cryogenic engine suitable for use on the GSLV. The decision to import cryogenic technology was taken to save time and because the Russians had offered the engine and technology for the same money as indigenous development would have cost Dr. Rao said.

Complex launch vehicle: The ASLV-D3 launch was "a very resounding success." The ASLV, though small, was a very complex launch vehicle with many advanced technologies needed for bigger and more powerful launch vehicles. The ASLV was a cost-effective way of developing launch vehicle technology, since a single ASLV cost only Rs. 5 crores against Rs. 30 crores for a PSLV and Rs. 40-50 crores a GSLV. The data generated by the ASLV-D3 launch was being analysed quickly so that the PSLV too could benefit from the experience gained.

Among the many ISRO scientists present at the press conference were the Director of the Vikram Sarabhai Space Centre, Dr. S.C. Gupta, the Director of the Liquid Propulsion Systems Centre, Dr. A.E. Muthunayagam, and the ASLV-SROSS Mission Director, Dr. M.S.R. Dev.

Satellite Television Delays Broadcasting Plan

92WT0187X Madras THE HINDU in English
6 May 92 p 6

[Text] New Delhi, 7 May: The challenge of satellite television was one of the unforeseen developments that delayed the implementation of the Prasar Bharati Act

and the creation of an autonomous broadcasting corporation, the Rajya Sabha was told today.

The Information and Broadcasting Minister, Mr. Ajit Kumar Panja, told members during question hour that when the Prasar Bharati Bill was being drafted satellite TV was not foreseen. As Satellite TV had added a new dimension to the electronic media, these aspects would have to be deliberated upon before the Act was implemented. "A sea change has taken place in the electronic media between 1990 and 1992," Mr. Panja said.

He said there were many issues to be sorted out such as transfer of assets. Once an autonomous corporation was swept up the entire assets of over Rs. 12,000 crores of the existing set-up had to be transferred. Then, there was the question of transfer of employees to the new corporation.

Mr. Panja was replying to questions from Mr. P. Upen-dra, a former Information and Broadcasting Minister, who wanted to know if the Government would fulfil its election manifesto promise of implementing the Prasar Bharati Act within one year of its rule.

Earlier, the Deputy Information and Broadcasting Minister, Ms. Girija Vyas, told Mr. Shankar Dayal Singh that the issue of giving competition to Prasar Bharati was also being considered. She said all formalities would be completed as early as possible.

Consultation: Mr. N.K.P. Salve, Congress(I), wanted to know if the Information and Broadcasting Ministry was consulting the Defence Ministry on the creation of the new broadcasting corporation. He questioned the safety in transferring about Rs. 12,000 crores to an entirely new corporation over which the Government would have no control at all.

Mr. Panja said he was not aware if the previous Government, which brought the Prasar Bharati Bill, had consulted the Defence Ministry on this aspect.

Guidelines for political news: The Information and Broadcasting Ministry had framed guidelines and norms for broadcasting and telecasting news about political parties, Ms. Girija Vyas said.

The guidelines called for coverage of political activities based on their news worthiness, unbiased reportings in respect of all political parties, different view points in the same bulletin to the extent possible, avoiding the use of labels such as "progressive" and "communal" and providing coverage of political controversies based on objectivity and fair play, she said.

Indian Firm Begins Ship-to-Shore Telecom Service

92WT0201 Madras THE HINDU in English 18 Jun 92 p 17

[Text] Videsh Sanchar Nigam, India's monopoly provider of international telecommunication services, has made its first move into the competitive global environment.

On May 31, it began offering the Inmarsat satellite-based ship-to-shore communications to vessels plying in the Indian Ocean, having commissioned a satellite earth station at Arvi near Pune. Telephone or telex users on board these ships can now have their calls to any land-based destination in the world switched by VSN's facilities in Bombay, a service that a dozen telecom companies, including Japan's KDD, offer. In this fiercely competitive market, the telephone or telex user at sea has the freedom to pick the telecom operator of his choice.

By the end of the first week, VSN had garnered about three per cent of the traffic in the region. "Our rates are very competitive," says the Chairman and Managing Director, Mr. B.K. Syngal, as he explains how VSN has immediately made an impact on the market. The tariff for ship-to-shore calls ranges from \$6.80 a minute on calls to any place in the world made during peak hours to \$3.80 a minute on calls made to an Indian city during off-peak hours.

Having invested Rs. 16 crores in installing the equipment for this service, VSN needs no more than five per cent of the Indian Ocean region traffic to break even. Mr. Syngal is confident of meeting that target rather quickly.

Huge Profits, Big Expansion Plan

The first foray into the competitive environment seems to have gone off well for VSN, which all these years has raked in sizable profits with its monopoly position in the domestic market. The profit before tax in 1991-92 was Rs. 176.14 crores on a turnover of Rs. 560 crores as against Rs. 152 crores on a turnover of Rs. 395 crores in 1990-91.

Most of this surplus, however, is being ploughed back. An Rs. 80-crore expansion programme in the current year, by far the biggest block of investment for any year, will quadruple capacity taking the number of international telephone circuits from 4,000 to 16,000 by March 1993.

While there could be questions as to whether such a quantum jump in capacity is justifiable, there can be no doubt that international telecom is a high growth market. Traffic grew by 30 per cent in 1989-90 over the previous year, and the growth rate slowed down to seven per cent in 1990-91 only because VSN's switching capacity could take no more.

New digital switching equipment was installed in Madras and Bombay, but with a further 30 per cent growth in traffic in 1991-92, the expanded capacity has almost entirely been filled. And there is enough confidence in VSN that the growth in telephone traffic this year will be as good if not better, especially with the globalisation of the economy.

Yet VSN's tariff for the conventional international telephone calls, as opposed to the competitive ship-to-shore rates, is among the highest in the world. A couple of years ago, the company did attempt to get the Government [to] approve a reduced rate for off-peak calls, but that proposition was shot down reportedly on the ground that since the circuits were all busy anyway, lower rates to entice increased usage in off-peak periods were unnecessary and inadvisable from the commercial standpoint.

That argument may not hold water once the additions to capacity fructify later this year and circuits remain idle outside the peak hours.

In Britain this year, there were ripples among consumer activists when British Telecom announced a huge £3 billion profit. Should not its consumers be given the benefit of lower tariffs, was their demand. With its large profits, VSN is as vulnerable to such criticism.

Routing of Calls Via U.S.

While it waits for the additions to its switching capacity, VSN has made arrangements with AT&T, the U.S. telecommunications company, to optimise the use of the 4,000 telephone circuits that radiate worldwide from VSN's hubs in Bombay, New Delhi or Madras. International calls are generally handled bilaterally, but should direct circuits between two countries be unavoidable, exchanges are programmed to route the calls through a third country. Starting this month, AT&T facilities in the United States will become virtually a fourth hub, switching calls from India to destinations not just in the U.S. but elsewhere in the world should traffic overflow on the direct route.

According to Mr. Syngal, there is advantage in choosing a U.S. operator to handle the overflow traffic because of the peculiarities of the traffic pattern. When traffic peaks on routes to Asia and Europe, it is still lean on the circuits to the U.S. and vice versa. So, instead of turning down a customer with the familiar tape-recorded message saying that "all circuits are busy on this route...please dial after some time," VSN has programmed the calls to be routed via the U.S. So the next time one calls Colombo, one's voice could well circle the globe.

Telematics Director Reports Telecom Situation

92WT0185X Bombay THE TIMES OF INDIA
in English 14 May 92 p 5

[Text] Bombay, 15 May: The executive director of C-DoT (Centre for the Development of Telematics), Mr.

B.D. Pradhan, today shared the view of space scientists that the recent American sanctions against the Indian Space Research Organisation (ISRO) would lead to an emphasis on indigenous development.

Mr. Pradhan said this while delivering the presidential address at a national seminar on "Telecommunications and Space: New Horizons," organised by the Indian Science Communicator's Association at Nehru Planetarium.

Mr. Pradhan said that India had the lowest telephone population. At present there were 6.5 million lines for a population of 850 million.

The target set for 1995 is to install telephones for 220,000 villages, and by the turn of the century C-DoT has planned to provide 20 million telephone lines. The increase thus envisaged is from the present 6.5 million lines to 20 million lines by the year 2000.

He said that at the moment there were 3,600 satellites in orbit of which 20 percent were in geo-stationary orbit used for communication purposes. "It is in the area of TV telecasts that satellites were being utilised to the maximum," he said.

Mr. Pradhan said that the present plans call for moving from geo-stationary satellites to low earth orbit satellites. He spoke of the Iridium project which envisaged connecting 77 low earth orbit satellites for giving telephone connections in the remotest areas of the earth.

According to him, though C-DoT did not find satellite communications very effective, yet it has proved its worth in the remote areas like the north-eastern region. Here the C-DoT has linked up with ISRO's Space Application Centre to provide communication services.

The chairman and managing director of Videsh Sanchar Nigam Limited, Mr. B.K. Syngal, said that the International Telecommunications Satellite Organisation (INTELSAT) was established in 1964.

Referring to the 21st century telecommunication scenario, he said, that from the customer's point of view, he should have a fully versatile system at his command for voice and data transmission and reception.

The director of ISRO's Space Application Centre, Mr. Pramod Kale, threw up the possibility of television signals being redirected, by which persons of a particular region who have migrated to another part of the country could watch programmes from their home towns.

Mr. Kale said that if this could be done it could become an effective alternative to STAR TV.

The Mahanagar Telephone Nigam Limited (MTNL) general manager, (planning), Mr. B.K. Basak, said that to begin with, cellular telephones would only be an embellishment on account of its exorbitant cost.

Liberalization of Telecom Services Urged*92WT0202 New Delhi INDIAN EXPRESS in English
14 Jun 92 p 14*

[Text] Bangalore—Telecom experts from all over the country have recommended an opening-up of the telecom services to enable the industry to keep pace with the quantum strides being made in the field globally.

The experts who discussed the issue at a workshop on "Liberalisation of Telecom Services" organised by the Institution of Electronics and Telecommunication Engineers (IETE) here, will draft a memorandum to the Centre listing key areas in the telecom sector where liberalisation was essential and also recommend safeguards so that the system doesn't turn into a Frankenstein monster.

T.H. Chowdary, member of the committee for suggesting amendments to the Indian Telegraph Act, declared that the committee's recommendations would be ready by August. "This archaic Act is totalitarian. It talks of the Government's rights but leaves the poor consumer in the lurch. Our attempt will be to give the consumer a say."

He pointed out that the Centre had already liberalised the manufacturing sector, moving from monopoly to multiplicity of producers to the immense benefit of the consumer. It was high time that the Central Government moved from administration of rules to rendering of service, he said.

Minister Announces Cellular Telephone Plans*92WT0199X Madras THE HINDU in English 6 Jun 92
p 8*

[Text] Hyderabad, June 5—Hyderabad and Bangalore are to have radio and cellular telephone facility along with the four metro cities.

The Union Minister of State for Communications, Mr. Rajesh Pilot, announcing this here on Friday, said the scope of the proposal originally covering New Delhi, Calcutta, Bombay and Madras was widened yesterday to include the two South Indian cities.

Mr. Pilot was laying the foundation for a Rs. 2.5-crore building to house the telephone exchange at Saroomagar on the outskirts of the City. The two-storeyed building would accommodate 20,000 lines. The Speaker of the AP Assembly, Mr. D. Sripada Rao, presided.

The Union Minister said the Government acknowledged the importance of communications as an idea in which the country could ill-afford to lag behind and had hence earmarked Rs. 40,000 crores in the 1992-93 budget, including Rs. 8,000 crores exclusively for improving facilities in rural areas.

Responding to a request by Mr. V. Hanumantha Rao, MP, the Union Minister said all the taluk headquarters towns in the State would be covered by STD facility by August 15, 1993.

As part of the liberalised policy, no prior permission was required to install fax facility. All one needed to do was to install, inform the authorities and pay the required fees. The Government was coming out with an ordinance to provide for stringent punishment—six months in jail—to those who start fax facility without informing the department and paying the fee.

Limit on duration: He said a five-minute ceiling would be imposed on duration of local calls, which would be metered in the multiples of five minutes. But as an additional facility, inter-dialling facility would be introduced between big cities and satellite towns or in a cluster of five taluks or villages, where the calls would be treated as local and not as STD.

Mr. Sripada Rao pleaded for extension of telephone facility in remote rural areas. He pleaded with the naxalites not to damage telephone exchanges and with the villagers not to misuse telecom property to make farm implements out of wooden poles.

Mr. M.R. Subrahmanyam, Chief General Manager, AP Telecom, said the new building with modern Max-1 telephone exchange would be ready in a year.

Joint Venture To Introduce Cellular Telephones*92WT0197X Madras INDIAN EXPRESS in English
15 May 92 p 3*

[Text] Madras—Subscribers to the cellular telephone services to be introduced next year in the country would have to shell out around six Indian rupees [Rs] per minute of air time for calls, according to indications.

The contenders, including several multi-nationals, have been given to understand by the Department of Telecommunications (DoT) that the tariff would be pegged at close to this figure. Besides, the monthly rental is likely to be around Rs. 3,000.

The Hong Kong-based Hutchison Telecommunication, bidding for this cellular telephone service, has tied up with Max India, part of the Bhai Mohan Singh group of companies. A joint venture has already been formed for entering the emerging field of telecommunication services. The company, Hutchison Max Telecom has submitted a proposal to the Foreign Investment Board offering paging services in the major cities of the country.

According to Hutchison group technical director Michael R. Kelly, the market for nation-wide paging service via satellite as well as for other services was quite impressive. In his reckoning, India was one of the biggest markets in Asia for value-added telecommunication services.

Hutchison which has a strong presence in key Asian capitals as well as the UK and Australia has launched the telepoint service which offers lower mobility and coverage than the cellular system. However, it is more economical.

This service is likely to be introduced in several other countries including Germany and France.

On the anvil is a personal communication network with the capability to support high population densities and personal numbering schemes.

Plans for Radio, Television Expansion Revealed

Eighth Plan Provisions

92WT0196A Bombay THE TIMES OF INDIA
in English 1 Jun 92 p 6

[Text] New Delhi, 31 May (PTI): A phased reduction of sponsored programmes on Doordarshan, an extension of AIR's national channel and a separate radio channel for the armed forces have been proposed in the eighth plan.

Twelve high power TV transmitters would also be set up in the border areas of Jammu and Kashmir, West Bengal, Bihar Rajasthan and Uttar Pradesh to expand coverage in these sensitive locations, according to the plan documents.

The thrust of Doordarshan's plans would be to extend its coverage to about 76 percent of the country's population, increasing the use of satellite linkage and to augment the production facilities at the existing centres.

Besides emphasis on augmentation of studio and outdoor facilities, it is planned that the sponsored programmes would be reduced to 40 percent of the total programme, while making more commissioned programmes to the tune of 60 percent.

The document calls for payment of advertisements on Doordarshan issued on behalf of government in order to promote cost consciousness among the latter.

"Doordarshan's revenue generation is often severely handicapped on account of the use of its prime time free of cost by these advertisements," it noted.

The plan document says an important effort, in the eighth plan for Doordarshan would be to overcome the congestion of the national channel by starting a second channel, which would permit diversification and variety.

This channel should provide quality entertainment so that it could compete effectively with foreign satellite TV services, private cable TV networks and video services.

"Very high professional skill and motivation to meet the challenge of others can only make the new channel a success. To ensure this, a new approach may be needed on its structure and organisation," the documents say.

Besides setting up 100 low power TV transmitters, mostly in hill regions and tribal areas in the eighth plan the emphasis would be on the introduction of satellite regional services through terrestrial re-broadcast transmitters.

Satellite news gathering facility is also proposed to be introduced during this period.

On the issue of funding of the electronic media particularly Doordarshan, irrespective of whether or not autonomy was forthcoming, it was necessary that these organisations made the most of commercial opportunities available to them, the document says.

Doordarshan should be able to sustain itself out of its own income both for current expenditure and investment needs, it notes.

The document also calls for ensuring credibility of the broadcasting media, which was vital and of immediate necessity.

Therefore, pending final action on the creation of the proposed Prasar Bharati, the endeavour should be to ensure that the electronic media enjoyed full functional autonomy and worked with professionalism.

Doubts on Accomplishment

92WT0196B Calcutta THE SUNDAY STATESMAN
in English 24 May 92 pp 1, 9

[Text] New Delhi, 23 May: The Government is likely to put off the commissioning of the proposed second national channel on Doordarshan for at least five years because of severe fund constraints.

Modernization and commissioning of more TV transmitters are also likely to suffer according to informed sources in the Ministry of Information and Broadcasting.

According to the plan outlay of the Eighth Five Year, the Information and Broadcasting Ministry is going to get Rs. 417 crores as the budgetary support leaving a huge amount of Rs. 3,217 crores to be collected as advertisement revenue, the sources pointed out. This is virtually an impossible task as it will amount to more than doubling the present income from advertisements in Doordarshan and AIR. The present income from these two sources is about Rs. 300 crores. With the Mahalak committee recommending a freeze in the advertisement tariffs which the Centre is likely to accept, the I and B officials see no solution to how the various modernization projects could be completed in the next five years.

The project which is likely to suffer the most and even might be shelved for a period of at least five years is the much talked about second national channel which was supposed to have the entertainment bias to counter the "invasion" of Star TV.

It was necessary to have a fund provision of at least Rs. 2,460 crores for the second channel in the national

network through satellite services. The money simply is not there and hopes of raising the fund through private participation is also black.

According to sources, the demand for the entire I and B Ministry in the Eighth Five Year Plan was placed at an ambitious Rs. 10,837 crores. While the Ministry expected a cut of about 25 percent, they never thought that the plan size would be reduced to less than half. That too in such a manner where the budgetary grants are minimum and the Ministry asked to raise funds from external sources. At present Doordarshan covers about 62 percent of the land area of India with the population coverage nearly 76 percent.

In the meantime, the Government is going ahead with the newly formulated broadcast policy which is likely to be tabled in Parliament in the next session after the technicalities are cleared by the Ministry of Communication. The Government proposes to regularize Cable TV networks operated by private entrepreneurs. Dish antennae will also be regularized, though the Government proposes to put a ban of redistribution of satellite programmes through Cable networks. Broadcasting rights will also be granted to the private parties in the existing second channels at the four metropolitan cities.

Further Details of Plans

92WT0196C Madras *INDIAN EXPRESS* in English
20 May 92 p 9

[Text] New Delhi—The coverage of All India Radio is expected to rise from 95.9 percent of the population to 97.5 percent while that of Doordarshan will go up from 81 percent to 90 percent during 1992-93.

On completion of the on-going programmes, All India Radio will cover the entire population of Bihar, Goa, Gujarat, Haryana, Manipur, Punjab, Tripura, West Bengal, and the Union Territories of Chandigarh, Dadra and Nagar Haveli, Daman and Diu, Lakshadweep and Minicoy Islands, Pondicherry and Delhi.

Doordarshan will also extend its reach all over the states of Goa, Orissa, and the Union Territories of Chandigarh, Daman and Diu, Pondicherry and Delhi, apart from near-complete coverage of the population in Haryana, Meghalaya, Sikkim, Tripura, West Bengal and union territories of Andaman and Nicobar and Lakshadweep and Minicoy Islands.

Information and Broadcasting Ministry sources told UNI that the country has 20 programme production centres for Doordarshan at present (excluding Delhi's central production centre), and installation work has been completed in 12 more centres.

The expansion plans show that the states where programme production centres are being set up for the first time, are Madhya Pradesh, Manipur, Meghalaya, Nagaland, Tripura and the Union territory of Pondicherry.

The projects being completed in 1992-93 include about 45 transmitters, transposers, studios and programme generation facilities for Doordarshan. The country has at present 62 high power (excluding the four metro channels) and 370 low power transmitters.

According to estimates, 77 radio broadcasting centres with studios at appropriate places and 186 Doordarshan kedaras/transmitters will be set up during the Eighth Plan.

Three Killed in Andhra Pradesh Landmine Blast

92WR0412A Madras *THE HINDU* in English
30 Jun 92 p 4

[Text] Dharmavaram, June 29—Three persons said to be supporters of the Cong.(I) were killed and five injured when a landmine blew up a jeep at Nakkalagutta, 9 km from here, at 8 this morning. According to the Superintendent of Police, Captain K. V. Reddy, the blast was allegedly engineered by the Kondapalli Seetharamaiah faction of the People's War Group.

The front portion of the jeep was blown to pieces and Gaddam Pullanna (40), his brother Gaddam Nagabhushanam (35) and Kesanna (28), a relative, died.

The extremists were waiting behind a hillock, about 60 metres from the road and after the blast, a group of 20 radicals opened fire on the survivors. Pullanna and Nagabhushanam died on the spot. While Kesanna died at the Government Hospital here three hours later.

Police say it could be an act of revenge. A central organiser of the PWG, Kese Naik was found dead after a meeting with Pullanna and his group, on May 8, 1990. He was acting on behalf of Amara Kesavaiah and his group, who reportedly belong to the Telugu Desam Party while Pullanna and others supported the Congress(I). The two factions have been at loggerheads.

Kese Naik was killed during an exchange of fire but it was not known from whose bullets he died.

All those involved belonged to Obulnayanipalli, about 3 km from where the incident took place about two years ago. Amara Kesavaiah had left the village because things had turned hot. It is said that he met Gaddam Pullanna three days ago at Dharmavaram to work out the terms of the compromise. Things had almost returned to normal between the two groups, because police say about 18 families which supported Amara Kesavaiah had come back to their native village after talks began between their faction leaders.

When reporters from the district headquarters town of Anantapur reached the scene, police personnel were searching the surrounding areas for bits and pieces of the jeep.

The Superintendent of Police and the Additional Superintendent Mr. G. P. Naidu, rushed to the site and

supervised the investigation. Search parties have been deputed to surrounding villages in a bid to nab the killers.

Bomb Kills Border Security Men in Dehra Dun

92WR0413A Madras *INDIAN EXPRESS* in English
22 Jun 92 p 1

[Text] (Express News Service) Dehradun—Terrorists killed two Border Security Force (BSF) personnel with a powerful bomb in the forests of Shergarh in Dehradun, 34 kms from here, on Haredwar road early on Sunday morning.

Those killed are Inspector B. S. Rawat and driver Satish Kumar, while constables Sukhvir Singh, Arjun Ram, Sita Ram and Raghuvir Singh, all BSF men were injured and have been admitted to the Doon hospital.

A civilian, Om Prakash of Shergarh, was abducted by the same group of terrorists and shot.

According to the BSF sources and police officials, the operation was meticulously planned and the BSF men became easy targets in the trap laid by the terrorists of the Babbar Khalsa outfit.

At 10.30 p.m. on Saturday, Om Prakash was abducted. His son Gopal followed them. The terrorist shot Om Prakash but let Gopal go. He went to the BSF post at Shergarh. As BSF personnel rushed to the spot, their post was attacked by the terrorists who fired several rounds.

The Doiwala police station, 14 kms from Shergarh was informed around 12.30 a.m. and three vehicles led by a truck of BSF men left Doiwala to take on the terrorists. At a small bridge the terrorists had planted a powerful bomb. It was so powerful that the engine of the truck fell at a distance of about 100 meters and Inspector Rawat and his driver were killed.

IRAN

New 5,000-Number Telephone Exchange Opened

NC1306084592 Tehran *Voice of the Islamic Republic of Iran First Program Network* in Persian 0330 GMT
13 Jun 92

[Text] The 5,000-number Fajr Telephone Exchange was inaugurated in Bakhtaran yesterday on the occasion of 'Id al-Adha. According to a Central News Unit report from Bakhtaran, the exchange cost 6.3 billion rials and has 45 outgoing channels, 75 incoming channels, and the capacity to expand to 30,000 numbers.

Other telephone exchanges have been opened in the past two days by the post, telegraph, and telephones minister. These include a 4,000-number exchange at Eslamabad, a 1,000-number exchange at Gilan-e Gharb, a 1,000-number exchange at Sar-e Pol-e Zahab, and a 4,000-number exchange at Harsin. The capacity of the Eslamabad-e Gharb exchange can be increased to 6,000

numbers; Gilan-e Gharb and Sar-e Pol-e Zahab can be expanded to 2,000 numbers, and Harsin can be expanded to 5,000 numbers.

Rudbar Telephone Center Begins Operations

92AS1258Z Tehran *ABRAR* in Persian 23 Jun 92 p 9

[Text] The 2,000-number automatic telephone center in Rudbar was opened on the second anniversary of the terrifying earthquake in this area in the presence of the minister of post, telegraph, and telephone.

IRNA's correspondent reports that the opening ceremonies held at the Rudbar Bala Bazaar Mosque were attended by the representative of the chief jurisconsult in Gilan, the governor-general of the province, a group of general managers, the governor, the Friday imam and a group of people from the area.

The building of the Rudbar Center for Agricultural Services was also opened in a ceremony attended by the governor and a group of officials. This building has a foundation of 800 square meters and cost 150 million rials to build. The gym and several health-care centers in Rudbar were also inspected by the minister of health care and treatment. The minister of health also visited the graves of earthquake victims and gave condolences to their families. Dr. Malekzadeh also reopened the rebuilt Gilan Medical College central staff building. This building was damaged during the Khordad 1369 earthquake and was given basic repairs at a cost of about 500 million rials.

Likewise a book and photo exhibition was opened in Manjil in observance of the earthquake's second anniversary. This exhibition, organized by the governor-general's office and the General Office of Islamic Guidance, will be open until 10 Tir [1 July].

An exhibition for the direct marketing of goods also opened in Manjil on Friday in a ceremony attended by the minister of industries, the minister of the interior and a group of province and local officials. The exhibit will have 160 booths on a site with 2,300 square meters of floor space.

This exhibition, which will be open to the public until 10 Tir [1 July], will feature various kinds of construction materials, household goods, electrical implements, clothing and shoes at reasonable prices.

In the last few days tens of housing units rebuilt by various ministries, government organizations and charity organizations were opened and given to earthquake victims.

Communications Center Inaugurated in Babol

92AS1210X Tehran *JAHAN-E ESLAM* in Persian
21 Jun 92 p 5

[Text] The 400 digital center manufactured by the Center for Research of the Iranian Communications

Company on a plot of 1,200 square meters of land, donated by the treasure-creating people of Babol, with 125 square meters under construction and at a cost of 60 million tomans, was inaugurated in the presence of Engineer Nariman, the deputy of the people of Babol, the director-general of the Iranian Communications Company, and the director-general of Mazandaran Province before the treasure-creating people of Babol. The director-general of the Iranian Communications Company explained the operation of communications in the past decade and announced: In the whole province at the time of the victory of the revolution, only 50,000 to 54,000 telephones existed. Since then that number has increased to 140,000 to 150,000 telephones.

It is hoped that with the fundamental program under way, it will increase to 280,000 telephones. Annually, 1.5 billion tomans are invested in communications for the province of Mazandaran.

He announced the rate of telephones for the large cities of the country to be 100,000 tomans; in cities with more than 1,000 numbers, 80,000 tomans; and under 1,000 numbers, 60,000 tomans.

IRAQ

People of Kurdistan Radio Suspends Band Transmission

NC2507195192

[Text] Voice of the People of Kurdistan in Arabic at 1705 GMT on 25 July broadcasts the following announcement: "We would like to draw the attention of our dear listeners to the fact that our transmission on the 75-meter band shortwave frequency [3900-4000 kHz] will be suspended until further notice due to technical failure. Our dear listeners can listen to our programs on the 41-meter band shortwave, on the frequency 7075 kHz; and the 49-meter band shortwave, on the frequency 5850 kHz."

The radio was heard with fair reception on 5850 kHz during the 1700-1746 GMT Arabic program on 25 July. Reception on 7075 kHz was poor to indistinct with intermittent jamming. Better reception, fair to poor, was observed on this frequency during the transmission of Kurdish-language programs before and after the Arabic program.

LEBANON

Sa'adah, ITU Official on 'Chaotic' Media Situation

NC0307162692 Beirut Voice of Lebanon in Arabic
1115 GMT 3 Jul 92

[Text] George Sa'adah, minister of post and telecommunications, met this morning with French expert (Marie Huellait), a representative of the International Telecommunications Union [ITU] in charge of examining the

status of radio and television stations in Lebanon. Engineer Maurice Ghazal, Lebanon's permanent representative at the ITU, also attended the meeting. According to informed sources, discussions centered on the status of Lebanese radio and television stations, the frequencies they use, and ways of organizing them and coordinating their operations so Lebanon does not exceed its share as specified by ITU conferences so as to avoid any negative effects on other regional stations.

The sources added that a report prepared by (Kanchez), a former ITU envoy, on radio and television frequencies in Lebanon was reviewed at the meeting. The report states that Lebanon has the right to operate six AM frequencies; however, dozens of stations are currently operating in this range only two of which registered with the ITU. The report adds that according to the ITU Geneva Conference of 1984, Lebanon has the right to operate 36 FM frequencies. Currently there are 146 FM stations operating in Lebanon, 110 of which are operating illegally. The report says that according to the Stockholm Conference of 1961, Lebanon has the right to operate 28 television stations. There are currently 46 Lebanese television stations operating here and applications to operate 56 others have been submitted. Only two these have been registered with the ITU.

The report explains that this chaotic situation has caused huge disruptions to the reception of other regional stations in violation of ITU resolutions.

Minister Sa'adah asked the French expert to devote six weeks to examining the issue and asked him to draw up a detailed report that will be used to organize all these services in accordance with international standards and Lebanon's rights. He placed at her disposal all information available to his ministry, stipulating that she should include in her report all necessary proposals to permit Lebanon to keep abreast of the rest of the world development in this area.

During the meeting, Minister Sa'adah telephoned Information Minister Michel Samahah to set up a 4 July meeting with the French expert and Eng. Ghazal for further discussions on this issue.

'Voice of the Koran' Radio Station Inaugurated

NC0807065292 Beirut AL-SAFIR in Arabic
29 Jun 92 p 8

[Excerpts] Tyre, AL-SAFIR—Grand Ja'farite Mufti Shaykh 'Abd- al-Amir Qabalan presided over the inauguration of the "Voice of the Koran Radio" [Idha'at Sawt al-Qur'an] in Tyre on 27 June. The ceremony was attended by a number of parliamentary, religious, and social figures.

Mufti Qabalan made a statement, saying: "This project—located in Tyre, close to Palestine, where religions meet—is meant to confront those who usurp the Church of the Holy Sepulcher, the Dome of the Rock Mosque, and Bethlehem." He went on to stress: "Israel

does not recognize Christianity or Islam, and opposes culture. With the Koran and the Bible, we will fight and conquer them."

Sidon shari'ah judge Shaykh Ahmad al-Zayn also made a statement, saying: "This Koranic project is meant to confront the Zionist Torah and Talmudic plan." [passage omitted]

Husyn Shihadah, director of the Koranic Studies Institute, said: "We are not exaggerating when we call for abolishing Zionist thinking, which encourages domination and bloodshed and shows no respect for humanity." He added that this radio station is just one way to confront the Zionist clique. [passage omitted]

Party Launches 'Green Lebanon' Radio

NC0508100892 Beirut AL-NAHAR in Arabic 31 Jul 92
p 8

[Text] "Green Lebanon" Radio [Idha'at Lubnan al-Akhdar] begins transmitting from al-Nabatiyah today in the name of the Democratic Socialist Party, led by Kamil al-As'ad [a Lebanese Shiite and former Chamber of Deputies speaker]. The station, which previously carried social programs and is now being used by the party, transmits from the home of al-Nabatiyah Deputy Engineer Anwar al-Sabah.

SAUDI ARABIA

Three Top Officials Discuss Communications

92WT0129B Jeddah AL-MADINAH in Arabic 2 Feb 92
p 5

[Unattributed interviews with three Saudi communications officials by 'Abd al-Razaq al-Sanusi; place and date not given: "International Organizations Headed By Three Saudi Officials; First Arabsat Chairman: 'Second Generation Satellite Production Go Ahead This Year'; First Intelsat Chairman: 'Developments in International Communications Services'; First INMARSAT Chairman: 'Overload Problems To Be Solved Soon'"]

[Text] Three Saudi officials are at the head of three of the largest international unions in the communications field. This highlights the role of the Kingdom of Saudi Arabia in this advanced international field, a great achievement and a wonderful pioneering leap in the field, similar to those in other cultural fields in various aspects of contemporary life under the boundless patronage of our wise government that is led by the guardian of the two holy places King Fahd bin 'Abd-al-Aziz and his excellency, his loyal heir to the throne.

The three officials are: Dr. Faysal Zaydan, deputy minister for telephones in the Ministry of Post, Telephone, and Telegraph and board chairman of Arab Organization for Space Communications [Arabsat]. He is the first board chairman of this organization. Eng. Muhammad

Jumayl Mula, deputy minister for operations and maintenance in the Ministry of Post, Telephone, and Telegraph and board chairman of the International Organization for Space Communications [Intelsat]. Eng. Sa'ad Damyati, board chairman for services and director general of engineering at the Ministry of Post, Telephone and Telegraph. He is the first board chairman of the international organization, INMARSAT.

AL-MADINAH met with the three officials to cast light upon the three organizations and to become acquainted with their tasks and accomplishments.

The minutes of the discussion follow.

First we asked Faisal Zaydan.

Eighteen Arab Ground Stations

[AL-MADINAH] In your capacity as the first board chairman of Arabsat, what is your assessment of this organization and how do you look upon its development so far?

[Zaydan] The Arab organization for space communications, Arabsat, was established in 1976 under the auspices of the Arab League. The intent was to create a comprehensive Arab network for space communications to provide and exploit an Arab space sector for general services specializing in the area of wire and wireless communications, in accordance with technical and economic standards that are practiced in an Arab context and internationally.

Three first generation satellites were in fact designed and built. The first was launched at the beginning of 1985, while the second was launched in the middle of that year under the supervision of the first Muslim Arab astronaut, His Royal Highness Prince Sultan bin Salman. The third satellite was stored for launch when the need arose. Arabsat also built two control stations, the main one in Riyadh and the auxiliary in Tunis.

The system first became operational in August 1989, by transmitting the activities of the Haj and the blessed al-Adhha feast. Commercial operations ensued for inter-regional telephonic linkage and the exchange of television programs between Arab states to the extent that the Arab states now have 18 ground stations. Exchange of television programs that cover the activities of Arab summit conferences, newscasts, cultural festivals and sport competitions also take place.

The Kingdom of Saudi Arabia leased 3.25 satellite channels and a high intensity space television channel on one of the satellites. The Sultanate of Oman, Morocco and Mauritania have each leased a space satellite channel. From the other satellite, the Arab Republic of Egypt has also leased a high intensity space television channel. Those countries use their satellite channels for telephonic linkage and to transmit local television and radio programs. In this way, Arabsat is the best means for direct transmission by the Arab states.

The Union of Arab Broadcasters also leases a satellite channel that is devoted to the daily transmission of the unified illustrated Arab news capsule, as well as the exchange of Arab television programs.

India has leased 12 satellite channels at a yearly rate of \$9.6 million.

Arabsat is used by two broadcasting stations to transmit their radio programs to the Arab states.

Arabsat has been able to realize the aims for which it was established under the patronage of the guardian of the two holy places. The organization has been able to overcome many of the problems facing it. The support of His Excellency Dr. 'Alawi Darwish Kayal, the minister of telegraph, post and telephone, and his active participation in many of the organization's meetings had a great impact in overcoming the difficulties which it faced. It has also witnessed tangible development in the area of the type and quality of the services rendered to Arab authorities and friendly countries, as well as in the area of training and qualifying Arab cadres. I am optimistic about our capability to continue the positive development of the organization, to guarantee its continued viability, and to present quality services with confidence.

Future Projects

[AL-MADINAH] What are the organization's future projects and to what extent do you expect them to be successful?

[Zaydan] Arabsat is currently attempting to manufacture second generation satellites. An international tender has been announced, and we expect that, God willing, analysis, appraisals and negotiations will result in signing the contract at the end of the year. Arabsat ensured that second generation satellites should include the most modern circuitry in the area of space communications and artificial satellites and the inclusion of new channels, in addition to current services, to enable it to offer traditional as well as modern digital services and more direct television transmissions employing small ground stations.

[AL-MADINAH] What is the number of operating circuits, and will they be increased to serve Arab states?

[Zaydan] On Arabsat satellites there are 2,350 operating telephone lines for Arab inter-regional telephone connections. It should be borne in mind that Arabsat offers satellite capacities to Arab authorities, and the authorities themselves determine the volume and type of services they require. There is continuous growth in the use of Arabsat operating telephone circuits and other services. On the other hand, there is a very large number of telephone lines that are used by India to link Indian cities and villages by telephone.

[AL-MADINAH] When will the third Arab satellite be launched and will that mean the end of the first and

second satellites, and what is the extent of their continued operation up until now?

[Zaydan] Arabsat has begun implementing the required preparatory steps to launch the third Arab satellite on the European rocket Arienne which is expected to take place at the end of this year. The necessary inspections and adjustments are currently taking place to prepare it for launch.

The launch of the third satellite is intended to bolster the reliability of the present Arabsat structure which consists of two satellites that have been in orbit since 1985. Keep in mind that first generation satellites were designed with a projected lifespan of seven years, beginning in 1985 and ending in 1992. In their seventh year, the satellites are still operating satisfactorily, which has led Arabsat to sign a contract to extend the lifespan of the first and second satellites and utilize them for three additional years.

[AL-MADINAH] Could you tell us about the last station to become operational? When was that and how successful has it been? Does the organization intend to inaugurate new stations?

[Zaydan] The station of the Arab Republic of Egypt was the last to become operational in the Arabsat structure. It was inaugurated 1 November 1991 and is successfully maintaining telephone and television linkage with the regional ground stations of the Arab states. Libya and Lebanon are expected to complete their ground stations shortly.

[AL-MADINAH] Is the organization currently facing any financial or operational problems?

[Zaydan] At the beginning of the project, Arabsat faced technical problems with the satellites and appropriate solutions were found for them at the time. There was also the problem of the large Arabsat debts which were incurred as a result of the deficit in paid capital over completion costs, in addition to the initial low rate of exploitation of satellite capacity. However, the great development in the growth of Arab traffic and that of friendly countries as well as the policy of holding down expenses and the discharge of all foreign experts by qualifying an Arab cadre to operate and maintain Arabsat from 1 January 1988, have contributed to providing a good income that enabled Arabsat to repay most of the debts. It will also enable it to cover launching costs for the third satellite and to repay the rest of its debts in addition to the formation of a core of the required capital to manufacture and launch second generation satellites.

Good Idea, Useful To Implement

[AL-MADINAH] Why should the organization not have a role in direct transmission so as to transmit selected programs from all participating countries to all Arab states, even if that was to come about through citizen

subscription, in order to end the terror experienced by the population from direct European and American transmission?

The Arabsat agreement limits its main role to making the space sector a means for providing services, including the direct transmission of television programs. The authorities in Arab member states operate their stations in all areas of telephone communications services, the transmission of television and radio programs and others. In fact, there are several Arab states that transmit their local program through Arabsat. In addition, Egypt is transmitting on the direct television channel through the high frequency collective television channel on the first satellite. I hope, God willing, that the direct television transmission channel on the second Arab satellite, which is reserved for the Kingdom, will soon become operational.

The proposed idea is good and its implementation will be useful to all as the Arab citizen will be offered a choice between of direct foreign television transmission. Moreover, in its direct transmission, Arabsat currently covers many non-Arab countries, in addition to its coverage of the Arab states. The Union of Arab States' Broadcasters, which is made up of all the television authorities in the Arab states, puts together newsreels from the Arab states and rebroadcasts them as a unified daily news bag. It also puts together Arab musical evenings of various types which are transmitted through the channel that is leased by Arabsat. Arabsat also encourages Arab television authorities, by way of the Union of Arab States' Broadcasters, to lease another television channel to implement the proposed idea by transmitting objective first-rate Arab programs round the clock. They should be varied and jointly produced by the private and public sectors in the Arab states. Keep in mind that this idea met with every encouragement and support from the unified Arab commission for the utilization of the space network for information, culture and development, which is headed by His Excellency Dr. 'Alawi Darwish Kayal, the minister of telegraph, post, and telephone in the Kingdom of Saudi Arabia. It approved the recommendation in its last session, which took place in Tunis in the period between 22-25 July 1991.

Uneven Capitalization

[AL-MADINAH] What is the number of participating Arab states in Arabsat and which of those states is the most prominent participant? How many stations are currently operational?

[Zaydan] All Arab League member states are participating members in the formation and establishment of Arabsat. Those states participate in capitalization unevenly. Eighteen Arab states also use Arabsat to various degrees. The largest capital investor is the Kingdom of Saudi Arabia which, in accordance with the directives of the guardian of the two holy places, spares no effort in supporting those local and regional organizations which benefit Arab and Islamic states. Of the other states,

Arabsat's biggest clients are ranked in the following order: The Kingdom of Saudi Arabia, the Arab Republic of Egypt, the United Arab Emirates, Morocco, the Sultanate of Oman, Jordan, and Mauritania.

The number of currently operational stations is 17, operating with great competence to support the main station in Dirab in Saudi Arabia and the auxiliary station in Tunis.

Intelsat's Important Role

On this occasion, AL-MADINAH met with Eng. Muhammed Jamil Mula, deputy minister for operations and maintenance and board chairman for the International Agency for Space Communications [Intelsat]. We asked him as well.

Successive Programs

[AL-MADINAH] As the first Arab to head an international organization like Intelsat, how do you view this organization and what are your expectations for its development in the coming years?

[Mula] Intelsat was established on 12 February 1973 by way of governmental as well as operational agreements. The main aim in establishing this agency is the creation of a communications network that links all countries of the world, with standardized billing for communications channels for all its satellite users.

Intelsat functions as cooperative commercial agency that is owned by member nations. It operates the communications system on an international level, aiming not so much at realizing a profit as at ensuring the provision of distinctive capabilities on a wide international scale.

The agency's board of governors oversees the design, development, creation and maintenance of the space enclave for its satellites in addition to the enactment of other activities that are undertaken by the agency. The board, which is composed of representatives from the 28 member nations that are signatories to the agreement, meets four times a year.

The agency completes its projects in the form of successive programs. It is currently working on launching the satellites of its sixth program to satisfy future communications needs. The capacity of a single satellite from this program will reach 24,000 two-way telephone circuits, or twice the capacity of fifth generation satellites. It also contains three television channels.

The program also includes the introduction of new circuitry in the satellite so as to enable ground stations to satisfy future communications needs at low costs. The lifespan of this generation's satellites reaches 13 years or twice the lifespan of fifth generation satellites.

[MADINAH] What are the agency's future projects that are due for completion next year?

[Mula] There is the agency's seventh program which consists of launching five satellites. They were designed to accommodate a larger communications capacity and higher performance standards, thus enabling them to provide larger operational capacities in comparison with Intelsat's fifth and sixth programs, especially for small stations.

The agency plays a central role in developing international communications services and in transforming their analogue circuitry to digital circuitry in the following areas:

1. Programming the digital system for integrated services on the international scale (ISDN);
2. High-definition television broadcasts to transmit events directly to the home;
3. Standardization of videophone programming;
4. Computer linking and data exchange to transmit and extract data.

[AL-MADINAH] What are the tasks that the agency performs on the international scale?

[Mula] Intelsat performs numerous phonic, video, data and broadcasting services for all communications purposes, commercial and domestic, on a local and international scale. On a world level, its services comprise two thirds of phonic and non-phonic international communications needs. It thus links communications networks with each other in all continents of the world. It also provides television transmission and radio broadcasting that is beamed from one point to one or more other points for various purposes that are exemplified in the transmission of complete news broadcasts, educational and entertainment programs, sport tournaments like the Olympic Games and World Cup soccer finals.

It is extremely important to point out that Intelsat provides a great service to society by linking a network of satellites in a certain place with one or more points in another place with great flexibility, a high standard of performance and low ground station costs.

[AL-MADINAH] What is the number of the agency's satellites and where are they located?

[Mula] The Intelsat satellite is circling in a stationary orbit 36,000 kilometers above the earth's surface. That means that if one were to observe it from above the earth's surface, it would appear to be stationary. A group of 15 satellites is orbiting above the oceans in the following distribution:

- Atlantic Ocean—seven satellites
- Indian Ocean—four satellites
- Pacific Ocean—four satellites

[AL-MADINAH] What has the Kingdom contributed to this agency? What is the volume of its participation and the extent of its benefit from that participation?

[Mula] The percentage of the participation of the Kingdom of Saudi Arabia in the organization is 1.82 percent of the organization's total investments. It thus occupies the 12th place among the signatories of its agreements.

[AL-MADINAH] What is the number of the agency's participating countries?

[Mula] The number of countries, agencies and international organizations that use the organization's capabilities is approximately 180 countries and agencies. Of those, 121 are organization members. All make use of its services at the local, regional and international levels.

[AL-MADINAH] What has the international agency contributed to the Kingdom recently?

[Mula] The Kingdom began using the Intelsat system in 1973. Initially, it used this system to ensure telephone and telex communications and television transmission on local and international levels temporarily. In 1975 and 1976 two satellite stations were constructed in Riyadh and Taif to operate the satellites that cover the areas of the Indian and Atlantic oceans. They are currently still operational, side by side with the reception antennae that are located in King Fahd Space Communications City in Jeddah. In general there are approximately 2,400 [as published] telephone circuits that are operating on the five Intelsat satellites above the three oceans.

[AL-MADINAH] What is the term of your chairmanship of this agency? Is it possible to be reelected?

[Mula] The deputy chairman of the board of the organization is elected for one year, and he is then elected as board chairman for another year by a vote of the board of governors. This term cannot be extended.

[AL-MADINAH] What is the international role of this agency?

[Mula] According to the agreement which established the organization, one of its chief responsibilities is the worldwide provision of extensive services. This plays a large part in strengthening the basis for international understanding. This organization is also gaining in importance by providing space communications services to replace or augment the ground networks like coaxial cables and microwave, especially in the third world.

The board of governors has adopted a project access program which aims at enabling the exploitation of space area capacity to provide educational, health and other socially oriented services, as well as to reach areas with limited communications capabilities.

AL-MADINAH also met with Eng. Sa'ad Damyati, chairman of the board of the international organization, INMARSAT, and put the following questions to him.

Congestion Problem

[AL-MADINAH] What is your view as the first Arab to head the INMARSAT agency?

[Damyati] As an Arab board chairman of an international organization like INMARSAT, my view of its organization and the development that it will undergo in the near future is one of pride in the reputation this earns for the precious fatherland in the world of communications. It is also one of pride in the mighty projects that have astonished everyone and which the government, the guardian of the two holy places, God preserve it, is diligently implementing. The Kingdom's accession to this lofty standing in the world of advanced communications has been achieved only through the constructive and positive participation of the Ministry of Post, Telephone and Telegraph in those international organizations, including the INMARSAT organization which provides mobile communications for all without any discrimination.

In the coming period, the period of my chairmanship of the board, the organization will witness very important developments, including the launching of two second generation satellites. A successful launch, God willing, will provide sufficient capabilities in the space sector and will eventually solve the congestion problem in communications traffic that some areas are experiencing. A permanent headquarters for the organization has also been acquired in London.

[AL-MADINAH] What is the agency's international role and what does it involve?

[Dimyati] The agency's international role involves INMARSAT as an international organization in whose activities member states from all over the world participate. It was established in 1979 according to an agreement that was signed by the members. The organization maintains telephone, telex and telegraph communications services. Information is sent to each of the following:

1. To ships on the high seas and yachts. Aid and rescue services for all large ships that are obliged to maintain aid and rescue procedures according to international maritime procedures are assured.
2. To airplanes and aerial navigation.
3. To mobile land stations.

The organization is working with member states to coordinate the introduction of several new digital standardized procedures to provide all types of communications services for maritime and aerial navigation and for mobile stations on dry land.

The organization guarantees the availability of the space sector for member states by leasing space sector capacities from other international organizations, as in the case of first generation satellites, or by contracting to build and launch its own satellites which it will operate, as in

the case of second and third generation satellites. Member states are then authorized to employ the space sector to provide all communications on a level that encompasses all areas of the world.

[AL-MADINAH] What is the number of participating states in the agency?

[Dimyati] The INMARSAT organization has 64 participating states.

[AL-MADINAH] How many satellites are operating for the agency and where are they?

[Dimyati] The organization's satellites and their locations are as follows: The organization operates ten satellites covering the globe. They are distributed as follows:

- The eastern Atlantic Ocean—two satellites
- The western Atlantic Ocean—one satellite
- The Indian Ocean—three satellites
- The Pacific Ocean—three satellites.

[AL-MADINAH] What are the agency's future projects during the coming years?

[Dimyati] Next year... will be an important period for the organization, as I previously indicated, because we will witness the launch of two second generation satellites and the purchase of a new headquarters for the organization. Contracts for ground control stations for second generation satellites will be concluded.

Additionally, new, digital circuitry services will begin to be implemented as of 1992.

[AL-MADINAH] What has the Kingdom contributed to INMARSAT?

[Dimyati] The Kingdom has contributed to the organization services that are very important for its future. It is perhaps appropriate to point out that the Kingdom was the first to employ the INMARSAT system in airplane communications. Following this initiative, the organization continued its efforts until it succeeded in standardizing airplane communications services by using satellites.

Of the organization's participating member countries, the Kingdom is considered to be the 17th in the rate of its participation. The Kingdom also has a large representation on the organization's board of directors, the general council and the technical committees. In its participation in the organization's activities, the Kingdom was afforded the opportunity of having the ministry's delegated employees familiarize themselves and train on these new systems. It also sought to distribute the organization's satellites in areas that provide the best coverage of the area of the Kingdom, which is the situation now. In spite of their high prices, the Kingdom utilizes the services of mobile stations in those areas that have no telephone links because of the easy access of those devices and their light weight.

[AL-MADINAH] What has the international agency provided for the Kingdom?

[Damyati] The organization provides communications services in the event of natural disasters and calamities like earthquakes, volcanos, floods and follow-up services free of charge as a humanitarian service by the organization for all the countries of the world without any discrimination.

[AL-MADINAH] What is the term of your chairmanship of this agency?

[Damyati] The term of my chairmanship of this organization is one year, with the possibility of reelection for another year.

Arabsat Income Reaches \$140 Million

92WT0129X London AL-SHARQ AL-AWSAT
in Arabic 23 Feb 92 p 9

[Article by Hasin al-Bunyan: "Third Arab Satellite Launched on Thursday"]

[Text] Riyadh—Next Thursday at dawn at the French Guiana missile site, a number of Arab communications ministers will observe the launch aboard a European "Arienne" rocket of the third Arabsat [Arab Organization for Space Communications] satellite. Costs for launching the Arab satellite amount to approximately \$32 million.

It is anticipated that—if launched successfully—this third Arab satellite will take over the services now provided by the second satellite, which include all Arab states' communications, television transmissions and the Egyptian space channel. Although it continues to operate successfully, the second Arabsat satellite completed last week its projected lifespan of seven years. After the transfer of services from the second satellite to this third satellite, the second satellite will be able to take over services from the first Arabsat satellite, allowing that original Arabsat satellite to be used for experimental purposes.

Eng. Faysal Ahmad Zaydan, Ph.D., board chairman of Arabsat, declared to AL-SHARQ AL-AWSAT that the organization's revenues since the first and second satellites became operational amounted to approximately \$140 million. He anticipates that by the end of this year, revenues will exceed the organization's capital of \$163 million which was paid by its charter countries. He indicated that those revenues were used to cover the organization's financial obligations and to finance the launch of the third satellite.

He said that the organization's space communications developments excelled in their ability to deliver direct

television transmissions to all Arab countries, the African and European continents and large parts of Asia.

The celebration to launch the third satellite will be attended by Dr. 'Alawi Darwish Kayal, the Saudi minister of telegraph, post and telephone, Dr. Faysal Zaydan, deputy minister and board chairman of Arabsat, a number of the ministry's functionaries, Eng. 'Abd al-Qadir Ba'ayri (Jaza'iri), director general of Arabsat who is now in France, as well as a number of Arab communications ministers.

On 13 March 1991, Arabsat had signed a contract in Riyadh with the Great Wall of China company to launch its third satellite by the Chinese rocket "Long March 3" from the "Shi Tan" base in Southwestern China. But for the three years that followed this Chinese offer, which was 30 percent below the Arienne launch cost, the third satellite remained in storage with the French manufacturing company, Arienne Space. This company had refused to send the Chinese any data or detailed information on the satellite's design. The matter was then reconsidered so that the launch would be conducted by the manufacturing company, Arienne Space.

Arabsat director general, Engineer 'Abd al-Qadir Bu'ayri, told AL-SHARQ AL-AWSAT that launching costs for the third Arab satellite will be financed from Arabsat revenues for services to the Arab states. He indicated that Arabsat self-financing is sufficient to cover the launch of the third satellite and to repay an important part of the organization's debts. Those were incurred, not because of losses, but because of a deficit in liquid capital brought about by rising costs in the manufacture of first generation satellites and control stations.

He added: "If, God forbid, the launch of the third satellite were to fail, then Arabsat will continue operations with the two existing satellites until the manufacture of second generation satellites takes place. We have begun conducting the necessary studies to achieve this at an opportune time. We are also always examining alternative plans to ensure continuity of services by all available means."

Engineer Bu'ayri indicated that the projected age of first generation satellites is seven years, which will be reached at the end of this year, approximately. However, Arabsat has conducted new channeling operations to extend the age of satellites by another three years. It is thus anticipated that the first and second satellites will continue to be operational until the end of 1994. They will then serve as auxiliaries to the third satellite which will be launched at dawn, next Thursday.

The Arabsat director general outlined the services that the third satellite will perform: "Originally, this satellite was to function in a standby capacity in the event, God forbid, that one of the two satellites would fail, even though they are both working successfully in their orbits.

The launch of the third satellite is intended as an expression of confidence in the Arabsat venture. It is also a means of dealing with the overload on the capabilities of the first and second satellites, in fulfilling orders from all parties, Arab or foreign, that currently wish to use Arabsat services." He explained that 19 Arab countries currently use Arabsat television and telephone services. There are also contracts with foreign countries, like India, which uses half of the services of the second satellite for its own purposes and its local services. There is also a contract to lease a satellite channel to the Union of Arab Broadcasters in order to have daily exchanges between radio and television stations. The radio station AL-SHARQ has a contract to transmit its programs from Paris to Lebanon. All this confirms the ability and capabilities of Arabsat to fulfill orders, primarily from the Arab countries, and to deliver the services that are demanded of it by countries in the vicinity of the Arab world, be they in Africa, Europe, or Asia.

TUNISIA

Television Satellite Transmissions To Begin 7 Nov
NC1206101792 Cairo MENA in Arabic 0818 GMT 12 Jun 92

[Text] Tunis, 12 Jun (MENA)—On 7 November, Tunisian television will begin broadcasting its programs on a space channel through Intelsat satellite to Europe, the Arab Maghreb, and the Middle East.

Tunisian Communications Ministry officials signed an agreement the day before yesterday with an American company to set up a space transmission and receiving station in Tunisia via satellite.

Egypt was the first Arab country to broadcast television programs on the Egyptian Space Channel through the Arab satellite, Arabsat.

REGIONAL AFFAIRS

EC Harmonized Data Transfer Plans Under Way*92WT0181X Copenhagen BERLINGSKE TIDENDE
in Danish 1 Jun 92 Sec III p 9*

[Article by Asbjorn Jorgensen: "Danish Research Network Leads the Way"]

[Text] *The EC Commission wants a European infrastructure that covers every aspect of communications. Therefore a great many separate projects are under way.*

In the initial phase Danish researchers and industrial experts will use a new data network to exchange electronic mail and large quantities of data. But in the long run the goal is to offer the network to the public to replace the private networks of multinational corporations, for example.

Three Danish groups stand behind the EC-supported project that has been christened ISI-DK: Jutland Telephone, Copenhagen University's Computer Science Institute, and the university's electronic data processing center, Uni-C.

Their contract with the EC Commission has become the model for a number of similar contracts in other EC countries with the same goal: harmonizing data transmissions within the EC.

"The EC Commission is trying to establish some locations where developers and suppliers can test the technology in order to speed up the process of acquiring some services to offer," said project leader Jens Bech Andersen of Jutland Telephone.

"There is nothing in the project that cannot be done today from a technical point of view. But the global infrastructure is very fragmented now and the goal of this kind of project is to build up a more uniform infrastructure throughout the EC."

The research world was chosen because there are already a great many different data networks. And because they are also used for a number of things that data communication is not ordinarily used for. Among other things researchers let the computers talk to each other and share tasks over long distances, something that requires an enormous capacity.

Klaus Hansen, an associate professor at the Computer Science Institute, put it this way: "The research world is a minisociety. We use all forms of communication, telephone calls, travel, letters, and data. And we are reasonably tolerant, we can live with things being only 95 percent effective."

Private Network

Initially Jutland Telephone will set up a so-called artificial private network in the existing Datapak network that everyone can subscribe to. It will conform to the X.25 standard and be capable of transmitting 2 megabits per second. Later it will be expanded substantially.

Uni-C will link the network with the existing Denet research network, while the university will be responsible for the electronic mail which the network will offer as early as this fall as the very first step—multimedia with transmission of pictures and sound may be considered later.

Danish suppliers like Dowty Network Systems, Danosi, and DDE have already been contacted to develop products for ISI-DK.

And when the suppliers, the telecommunications companies, and the researchers have tested the network sufficiently, the real customers will be brought in.

Ole Carsten Pedersen of Uni-C: "Big Danish firms select their private communications structures. For example, Novo Nordisk, Maersk, OK, SAS, and so on. But they are largely unable to communicate with each other. It is crazy that they form their own networks, it is as if everyone built his own highway. Thus it is an important aim of the EC Commission to eliminate all the ad hoc structures."

British Telecom Joins European Network*92WT0210A London THE DAILY TELEGRAPH
in English 7 Jul 92 p 20*

[Text] Europe's five biggest telecommunications companies united yesterday to ease cross-frontier bottlenecks.

British Telecom, France Telecom, Deutsche Telekom, Telefonica of Spain and ASST-STET of Italy have agreed to jointly develop a fibre-based network to improve service to customers and speed up maintenance.

The existing systems in the five countries will be more closely interlinked through a series of new switching installations under the umbrella of what the five have dubbed the Global European Network.

The companies say they will remain in competition for customers but will share capacity to offer their existing services and develop new value-added facilities.

—Claus-Dieter Ehlermann, a director general in the European Community's competition directorate, said yesterday at a London conference organised by the FINANCIAL TIMES there may be a role for the European Commission or a central authority to co-ordinate telecommunications regulators throughout the EC.

Closer Ties Among Nordic Telecommunications Firms

92WT0194A Copenhagen BERLINGSKE TIDENDE
in Danish 18 Jun 92 pp III-4

[Article by Asbjorn Jorgensen: "The Nordic Telecommunications Services in Closer Cooperation"]

[Text] Nordtel consists of Tele Danmark A/S, P&T Finland, P&T Iceland, Televerket Norge, and the Swedish Telecommunications Service. The present technical cooperation will be expanded to include more business-related aspects.

Communications: The telecommunications services of the five Nordic countries will cooperate much more closely, even in the area of exports. Tele Danmark will teach its counterparts to be corporations.

Joint subsidiaries, the development of new services, and joint work on exports are some of the things the Nordic telecommunications services will achieve by forming more or less identical corporations.

The background for this is the stiff competition in telephony and telecommunications, which is becoming more and more serious during the nineties.

With total sales of 80 billion kroner, the five Nordic telecommunications services are a powerful factor on the domestic market, but they are small compared to the foreign giants.

Consequently, they must be as well-organized as possible. This means reorganizing as corporations as quickly as possible, according to their leaders.

This wish, which is very sensitive politically, is presented in a carefully worded press release from a Nordtel meeting. So far, only Denmark has established a telecommunications corporation, Tele Danmark A/S, which is now working hard to restructure and streamline its operation, laying off 1,600 workers in the process.

Its competitive strength shall be increased on "both the national and international levels, since in the future national boundaries will not isolate the various national markets," the press release stated.

The Nordtel chairman, Tele Danmark Administrative Director Hans Wurtzen, prefers not to comment on the controversial press release. He said, however, that the Nordtel cooperation could be expanded much more easily if the five countries had identical telephone companies.

"It will be easier to reach agreements on cooperation and to form joint companies when we no longer have to worry about government appropriations. And when the competition increases, we will also be able to use our joint resources outside the Nordic countries."

Wurtzen chose not to mention specific areas of operation. The press release indicated that experience gained in the formation of Tele Danmark could be used in the other Nordic countries.

Czech Philips Subsidiary Begins Operating

92WS0621X Chichester INTERNATIONAL
TELECOMMUNICATIONS INTELLIGENCE
in English 4 May 92 p 1

[Article: "New Philips Subsidiary Goes Into Operation"]

[Text] Philips Kommunikations Industrie of Nuremberg says its new subsidiary in Czechoslovakia has begun operating in Prague. The new company, Philips Komunika ni Systemy Spol. [word illegible] (PKCS) will be geared towards supplying Philips' transmission, switching, and data communication systems to network operators in the CSFR to establish, modernise and expand their communication networks.

According to Philips, PKCS is expected to begin independent production early next year, at which time the company will employ between 150 and 200 workers in research, manufacturing, sales and administrative operations.

In accordance with Philips' plans, by 1994 PKCS will have a staff of 250, attaining a turnover of approximately DM50 million. To date, PKI says orders worth around DM5 million have been received.

According to the Managing Director of PKCS, Norbert Rex, a PCM30FC multiplex system is already undergoing testing with the research institute of the Czechoslovakian PTT, VUS. When the system receives approval, PKCS will manufacture a pilot series, says Heinrich Holle, Sales Manager at PKCS.

PKCS's new office is currently located in Prague in Konevova 141, 130 00 Praha 3, Telephone: (02) 26 41-9; (02) 26 32 88-9. A second office will open in Bratislava shortly.

At the end of last year, Philips-TRT of France reached an agreement with Tesla Prievidza and APRC in Czechoslovakia to establish a joint venture company called Signal Telecom to produce the multi-access subscriber distribution systems IRT 1500 and IRT 2000 in Czechoslovakia (see ITI issue 315).

CYPRUS

CyTA To Take Part in INMARSAT

NC0107194792 Nicosia CYPRUS NEWS AGENCY
in English 1450 GMT 1 Jul 92

[Text] Nicosia, Jul 1 (CNA)—Cyprus has joined INMARSAT, the International Maritime Satellite Organization that provides worldwide mobile communications for maritime, aeronautical and land mobile users.

The Cyprus Telecommunications Authority (CyTA) will represent the island in INMARSAT as a signatory and shareholder of 1.42 percent, equivalent of Cyprus's usage of the system. This represents an investment of 1.8 million Cyprus pounds.

Cyprus's advantageous geographical position, the improvement of local telecommunications infrastructure, along with several governmental incentives, contributed to the increase of Cyprus marine fleet and attracted a large number of international shipping companies to the island.

- A CyTA announcement states that joining INMARSAT will benefit Cyprus both politically and financially.

Cyprus is becoming an internationally recognised maritime center and developing into a major telecommunications hub in the eastern Mediterranean and joining INMARSAT as its 65th member is considered to be an important investment and expected to have high returns, the statement added.

DENMARK

'Critical' Situation in Mobile Phone Industry

92WT0181X Copenhagen BERLINGSKE TIDENDE
in Danish 5 Jun 92 Sec III p 5

[Article by Asbjorn Jorgensen: "Situation Critical for Danish NMT Mobile Phone Producers"]

[Text] Denmark has around 180,000 subscribers to the NMT mobile phone system. Motorola, Nokia, Ericsson, and Philips account for the majority of sales which are expected to reach 35,000 this year. Three-fourths of new purchases are pocket models, despite the higher price. A mobile telephone sells for around 8,000 kroner.

Danish production of mobile telephones may soon come to a halt. The traditional manufacturers are suffering from financial problems.

The other day the first telephone for the new GSM mobile phone system was approved in this country. The Telecommunications Administration granted Motorola provisional permission to sell the new equipment until a final test can be made.

That was the starting signal for the final race in the contest that will determine the fate of Denmark's proud tradition of mobile phone production. GSM will quickly become the standard, especially on the lucrative German and French markets, and the joint European GSM system will also overtake the Nordic NMT system on the domestic market.

The future does not look bright. Mobile phone production in Denmark has shrunk, there is stiff competition from abroad and there are deficits all around.

The names of Storno and AP Radio have rich traditional connotations. Both were prime movers behind the

Nordic NMT system which is considered the world's best mobile telephone system.

Storno was sold by Store Nord to General Electric in 1975 and resold to U.S. Motorola in 1985. Today the Storno name has taken a back seat, 3,000 employees have shrunk to 500 in Denmark and the same number at the factory in Flensburg. All production in Denmark has been halted and the latest published figures showed a deficit of 57 million kroner. Motorola now seems to be moving up again. In 1991 sales amounted to around 2 billion kroner, "adjustments" in the organization have led to the dismissal of hundreds of employees in the last few years and Motorola has located its European development division in Denmark.

Beautiful Phone

AP Radio has become Philips. AP made one of the NMT system's best and most elegant mobile phones. But production of NMT mobile phones has also declined at Philips Danmark. When GSM gradually overtakes the NMT market in the Nordic countries, Holland, and the Alps, Philips will probably shut down its production of car phones in this country.

Today the Danish manufacturing firms are Cetelco and Dancall, both located in northern Jutland. But both produce big deficits.

So Dancall Radio, Inc. in Pandrup is trying to raise a good 100 million kroner on the Copenhagen Stock Exchange. Not because the firm is about to expand or wants to win new markets. On the contrary, this is a question of survival after the company rang up a deficit of 99.6 million kroner last year. And in a growth market too.

This quote is from Dancall's newspaper announcement of the stock offer:

"It is primarily due to the fact that Dancall's previous mobile telephone product program was no longer sufficiently competitive." In plain language: The models are too old-fashioned now that people want elegant and inexpensive pocket versions.

"An infusion of capital is necessary to insure continued operation as planned and to develop Dancall further and strengthen the company's capital base."

Dancall has also acknowledged its small size. This has led to the formation of a strategic alliance with Philips for mutual development and the exchange of technology.

"This gives us an opportunity to share development costs and obtain cheaper components. In return Philips will be able to acquire some products for distribution," said administrative director Jorn M. Nielsen.

"The cooperation is not an irrevocable arrangement. But we have to get something commercial out of it."

Dancall will have a hard time doing this. At any rate sources in the branch give the firm, which has a work force of over 600 people, very little chance after the resounding deficit. Another reason for this assessment is that with an export share of 90 percent Dancall practically has to supply GSM equipment. Each new model requires development at a cost of around 100 million kroner as well as advanced production equipment.

Here Cetelco, Dancall's competitor and neighbor, will lend a hand.

Joint Development

Together Cetelco and Dancall, along with a third participant, Aalborg University Center, have developed a GSM telephone that will be ready to go on the market within a few months.

The joint development leaves off where mechanical details and appearance take over so the models will be identical inside but have different exteriors.

From Stovring Cetelco director Henning Vilslev said:

"Roughly 130 man years were required to develop a GSM telephone. One man year costs around 750,000 kroner. Therefore we had to work together.

"I view the future with reasonable confidence; after investing 60 million kroner in production equipment we are ready to produce 60,000-80,000 GSM telephones a year. And we will get started as soon as we receive approval."

However, Cetelco has had deficits in the first three years the company has been in existence.

Tele Danmark Subsidiary Offers Network Services

92WT0200A Copenhagen BERLINGSKE TIDENDE
in Danish 6 Jul 92 pp III-3

[Article by Asbjorn Jorgensen: "Temanet Hopes To Conquer the World"]

[Text] *Temanet will sell data network and network services to multinational firms. Its competitors are giants like British Telecom and AT&T. But, it is an advantage to be small, they are saying at Hoje Tastrup.*

Jan Zneider and Jens Otto Daugard will take up the challenge against the telecommunications giants.

And they will win. They do not have billions to put into the contest. Instead, they intend to put together a small, effective team that can draw upon a large support base of experts.

Starting with the new year, the competition will be unleashed in earnest upon the European telephone and data network. At that point most of western Europe will be opened up to the "resale of leased lines."

This step is the most important to date of a series of liberalizations being pushed through by the EC Commission. As of the present, the sale of telephones and the installation of switching systems can no longer be monopolized.

The gains from the earlier liberalizations were small change compared with the billions that are now for the taking. The basic sustenance of the telephone companies is threatened.

The Gold Mine Is Opened

For our own Tele Danmark, the right to "resale of leased lines" means that the company's gold mine is opened up to the outside world, that is, Telecom's international operation in data transference and, in the 1990's, possibly voice communication, as well.

Last year, Tele Danmark was looking for a means to hold on to its customers and win new markets for itself. It found what it wanted in A.P. Moller: Maersk Data has expertise in operating EDP [Electronic Data Processing] systems and operating Maersk's global EDP network. And Maersk Lines offices are found in all corners of the world.

Late last fall, Temanet A/S was founded as the daughter company of Telecom and Maersk Data.

The goal: to supply and operate EDP and telephone networks for international firms, along with other diverse services to the networks.

New Concept

Administrative Director Jan Zneider:

"Competition in telecommunications is an entirely new concept. Now the subscribers have a choice; thus they change from being subscribers to being customers. There will be a lot of new players on the field, with excess supply and a fall in prices as the result.

"For example, there is no technological reason why the price should multiply by 10 just because a call crosses national borders.

"Telecom must first insure that its own customer base is not stolen. The customer must have the circumstances that suit his needs: guarantees, appropriate prices, assurances that the network will operate, that the call will go through."

Gateway to Europe

Temanet's customers are large companies who need reliable connections.

Temanet leases large telecommunications connections through cable or satellite and turns around and sells them again to its customers. Temanet will supervise the network and plans in time to offer a variety of extra EDP services which will eliminate the need for customers to retain their own experts.

"The revenues from leased lines will not last forever, prices will fall. Consequently we must live off of other services," said Zneider.

Step 1 consists of Telecom's current customers, all large firms with interests abroad. Step 2 consists of expansion outside the nation's borders.

"We must insure that Telecom does not lose customers and, at the same time, we must become international VANS [Value Added Network Services] suppliers. Geography favors us. Denmark has water on all sides and therefore good cable connections with the outside world. Via satellite we can reach the whole world in a single satellite hop.

"Temanet can be the gateway to Europe for overseas firms because we are familiar with all aspects of European telecommunications. In addition, Denmark has a stable work force, low inflation, and a high level of technology," said Jan Zneider.

Going Abroad

"As quickly as possible, we intend to establish offices abroad in the most important centers. Offices in London, New York, Stockholm, and Frankfurt will be in place by fall. We will launch ourselves from Maersk offices with a Danish director and local salesmen as staff. It is extremely important to get the right people.

"This year the staff will number a bit over 20 people, primarily sales and marketing people, but all Telecom and Maersk Data employees are, in reality, ours as well."

The objective in this fiscal period—actually two years from now—is to have at least 60 people, 33 of them abroad. In two years, the firm should make a profit.

Big Is Not Better

One of the most difficult hurdles will be to compete against the foreign telecommunications giants on their home turf.

Even though Tele Danmark and A.P. Moller are among the top five of the nation's largest firms, it is a long step up to the United States' AT&T and Japan's NTT. And Temanet will not be a heavyweight.

Zneider:

"Big and rich is not synonymous with survival. If you look at EDP suppliers, you find that the big ones have thinned out. Even IBM has problems. The name of the game is to be specialized and low cost, in the end it comes down to price. We can do it as well as any of the others and do it with controlled growth.

"You do not sail into the harbor with a supertanker, especially when a storm is brewing and no one knows which way it will go. Therefore, we are maintaining a small, top-trimmed organization. The technical development and conversion from analog to digital technology

means that before long there will be all too many people in the telecommunications sector.

Middleman

"As a consequence, Temanet must be a primary contractor and a middleman and not build up a mammoth organization. Subcontractors will develop the products and services. Filial ties will provide close relationships with firms that have both infrastructure and value-added services."

Zneider is referring to Maersk Data and its subsidiary CMA Data, as well as to Tele Danmark and the Telecom, Dannes, and Comlink companies.

[Box, p III-3]

VANS means Value Added Network Services or special network services. For example, VANS suppliers operate the data networks owned by others, sell data communication and electronic document exchange.

FRANCE

France Telecom Prepares To Join Syncordia

92WS0406X Paris L'USINE NOUVELLE in French
5 Mar 92 p 26

[Article by Jean-Pierre Jolivet: "By Joining Syncordia With the British, Germans, and NTT, France Telecom Joins Battle of International Networks"]

[Text] *The stakes: The value-added telecommunications market for the big business enterprises. Staying out of it is out of the question.*

Internationalization is one of France Telecom's top priorities. Its president, Marcel Roulet, would therefore like to associate his enterprise with British Telecom, Deutsche Telekom, and Japan's NTT in the future Syncordia network. Absent that association, he knows, France Telecom would find itself excluded from a particularly profitable market.

With the British as the originators, this project seeks to bring the big telecommunications operators together to set up an international private telecommunications network offering its services (voice, data, image) to the big multi- and transnationals, that is, to the pick of worldwide enterprises. The stakes are sizable: The value-added telecommunications services market will double by the end of the current decade, to over 4,000 billion French francs [Fr].

But it is also an opportunity for the national operating entities to check the expansionist trend of major competitors such as Electronic Data Systems (EDS), General Electric Information Systems Company (GEISCO), and even IBM, which already has worldwide networks of this type.

France Telecom's president Marcel Roulet is conducting tough negotiations in a climate of serious competition between France Telecom and British Telecom. This competition dates back well beyond yesterday. British Telecom has set foot on the French market and has even dared to land the management of the Axa Insurance group's international network. Axa Insurance is one of France Telecom's big clients. The French, for their part, have not hesitated to hunt on British preserves. France Telecom's subsidiary Transpac has recently landed the London Regional Transport network, which will bring it into close touch with some 2 million users over the next four years.

Despite British reluctance, and thanks to support by Deutsche Telekom, the principle of welcoming France Telecom into Syncordia now appears settled. "Our joining will nevertheless be subject to terms and conditions that have yet to be negotiated," says France Telecom, which does not want to be forced to accept humiliating terms at the hands of the British. Be that as it may, France Telecom can hardly expect to make out on its own. "The Syncordia operation will provide the sector with a definitive structure," said France Telecom Director General Charles Rozmarin recently.

Failure to join the Syncordia consortium would compel France Telecom to turn toward other big potential partners. One possibility might be AT&T, which is preparing, moreover, to take control of the French SSII [data processing services and engineering company] Dataid. France Telecom can hardly hope to realize 10 percent of its activity in the international sphere without resorting to alliances, hence making a few concessions.

France Telecom Establishes Scientific Advisory Council

92WS0661B Chichester INTERNATIONAL
TELECOMMUNICATIONS INTELLIGENCE
in English 15 Jun 92 p 1

[Article: "France Telecom Establishes Scientific Advisory Council"]

[Text] France Telecom has set up a scientific advisory council whose panel is made up of members of leading independent scientific authorities. The French operator lists the council's missions to include "defining the directions of long-term research, benchmarking of current research against the global state-of-the-art, and assessing the potential of the group's research resources and organisation." The council also seeks to strengthen research ties between France Telecom and other European countries.

The 12-member scientific council is chaired by Jacques Friedel, who is president of France's Academia des Sciences.

Ten of the members were selected to ensure a multi-disciplinary make-up which spans key telecommunications-related areas, France Telecom said. The two

remaining members are from France Telecom: Michel Feneyrol is head of the CNET telecommunications centre, and Jean-Pierre Poltevin is director of France Telecom's production unit.

France Telecom's research and development expenditures totalled Fr4 billion in 1991, or about 4 percent of turnover. Half of last year's sum went to the CNET research centre and the remainder was used to fund work carried out under research contracts by both state laboratories and private-sector businesses.

GERMANY

Telekom Starts New Mobile Phone Network

92GE0421Z Frankfurt/Main BLICK DURCH DIE
WIRTSCHAFT in German 2 Jul 92 p 8

[Report by ap: "Telekom Opens New Mobile Telephone Network to Customers"]

[Text] Bonn—Following a one-year delay, the German Postal and Telecommunications Service's Telekom has opened its new D1 mobile telephone network to customers. Telekom intends to make 38,000 D-Network telephones available to the public at prices between 2,700 and 4,000 German marks [DM] by the end of the year. Executive board member Klaus Hummel explained that because technical problems are still expected during the start-up period, Telekom will not charge basic monthly user fees prior to 31 December.

Telekom's new D1 network is in competition with the D2 network, operated by Mannesmann, which went into service late last week. Both networks are the same in regard to technology: They operate on the uniform European GSM [Special Mobile Group] standard. Advantages for the customer include digital voice transmission, which, unlike mobile telephones used to date in the C-Network, permits noise-free connections, as well as a considerably larger number of potential subscribers.

According to Telekom information, the D1 network will have 2 to 3 million subscribers by the year 2000, whereas the C-Network, which will continue in operation, will soon have reached the limit of its capacity at 800,000 subscribers. Because of the large unit volumes expected, both equipment and calling costs are likely to go down in the foreseeable future. Another advantage is that, thanks to the uniform standard, telephoning with D-Network equipment will be possible throughout Europe in the long term.

At the beginning of the official market inauguration period, Telekom announced the following prices, value-added tax included in each case: The one-time initial fee is DM74.10 and the basic monthly user charge is DM79.80. The latter progressively declines according to the number of a customer's telephone hookups to a minimum of DM64.99 for more than 200 telephones. Calling charges are DM1.67 per minute for domestic

calls between 0700 and 2000 Monday through Friday, and DM0.52 per minute for all other times. Telekom is currently offering two terminal devices at prices between DM2,650 and DM3,850—depending upon features. An additional mobile telephone is to be offered in the autumn at a price of—depending upon features—between DM3,250 and DM3,710, as well as a handheld telephone for DM3,980. Mannesmann charges a one-time hook-up fee of DM77.52 and a basic monthly user charge of the same amount for the D2 network. In this case too, there is a volume discount to a minimum of DM62.02 for more than 500 telephones. Calling charges are DM1.65 [per minute] on workdays between 0700 and 1900, and DM0.50 [per minute] at other times. Mannesmann offers terminal equipment for between DM2,495 and DM3,650.

Telekom, with its D1 network, is not only operating a telephone network in competition with a private vendor for the first time—something which is the result of Postal Service reform—but it has also chosen a new marketing method for its network. To be sure, Telekom is also marketing its D1 network itself, but there are 12 private service providers in addition. They bill the customer directly and are free to set their own rates. Discounts for frequent callers have been announced by the service providers, for example.

There are likely to be rate differences for so-called value-added services as well. Value-added services are additional services that are paid for by way of the telephone bill. For example, Telekom offers a hotel reservation service, together with Varta, for which there is a charge of DM1.85 per minute. Secretarial services for the reception and forwarding of messages or traffic information are also conceivable, for example.

The D1 network was originally to have gone into operation as early as July 1991, but, contrary to planning, there were still no approved terminal devices at the time. According to information from Telekom, the delay was primarily caused by the late finalization of the GSM standard. The telephones coming onto the market will be provisionally approved to the end of the year, but any retrofitting which may be necessary will be done by Telekom free of charge.

Telekom Spends Large Sums in New Laender

92GE0416X Frankfurt/Main FRANKFURTER
ALLGEMEINE in German 16 Jun 92 p 16

[Report by enn.: "Telekom Invests More in East Than Planned: Concern About Equity Capital Ratio"]

[Text] Berlin, 15 Jun—Telekom wants to accelerate the expansion of the telephone network in the new laender. At least 600,000 new subscribers are to be hooked up this year—more than initially planned; as of late May, some 289,000 subscribers had already been connected. Telekom Managing Director Helmut Rieke puts the total amount invested at about 10 billion German marks

[DM]. As the largest single investor in eastern Germany, Telekom spent DM5.5 billion in the new laender in 1991.

Rieke announced in Berlin on Monday that Telekom wanted to provide 800,000 service installations in 1993, to be sure, there are presently 2.2 million service orders. Following the transition, there were approximately 1.8 million subscriber connections in the former GDR, just under 1 million of which were multiple-telephone hookups. Private companies that are providing turn-key telephone networks in limited regions are helping considerably in working off the backlog; they are providing 200,000 subscriber installations this year. In addition, Telekom plans to continue to expand mobile telephone service in the east: Nearly area-wide service is to be established this year for the C-Network, and in 1993 for the D1 Network.

Rieke said that its involvement in the new laender was driving Telekom "to the threshold of financial pain," yet its returns in the east were lagging behind expectations. Rieke is counting on DM5.7 billion in expenditures and DM4 billion in receipts for this year. In view of the enormous investments in the new laender, the equilibrium of its investment program is threatening to get out of kilter. Furthermore, the East European countries are demanding greater participation in the expansion of their wretched telecommunications infrastructure. According to Rieke's statement, net indebtedness in 1992 will be in the vicinity of DM15-16 billion. Telekom is being forced to finance a larger share of its investments through loans. In 1991, DM5.5 billion was spent for interest payments alone.

Telekom's equity capital ratio, which by law is not permitted to drop below 33 percent, amounted to around 27 percent in late 1991 and is expected to decline to 24 percent by the end of this year. The international average for this line of business is around 50 percent. Rieke is therefore calling for a DM20-billion increase in equity capital, which would raise the ratio to approximately 40 percent. The only feasible way of being able to raise equity capital quickly and in the desired amount would be to transform Telekom into a joint stock company. Rieke characterized rate increases as "the most disastrous way" of doing so, since, as a contrary trend, international competition is forcing a reduction in rates.

Rieke also added that the telephone networks in east and west Berlin, which to date have been separate, would be interconnected in two weeks. All local subscribers can then be reached without the previously applicable "9" or "849" prefixes. When calling from western Germany, all Berlin telephones have to be dialed up with the "030" prefix. By the end of next year, the prefixes of the local networks in the new laender are to be standardized as well.

GREECE

'Illegal' Television Station Relaying Turkish Channel

NC1706134292 Athens Elliniki Radhiofonia Radio Network in Greek 1130 GMT 17 Jun 92

[Excerpt] An illegal satellite television station, relaying the Turkish Star Channel, has been located on the mountain Parnis Oros. Transport and Communications Minister Nikolaos Gelestathis said in a statement today that one of his ministry's departments detected the illegal station last Sunday noon and immediately informed the Athens Magistrate Court prosecutor.

According to Gelestathis, the satellite television station relays Star under the name Channel 63, transmitting on 8.05 mHz [as heard]. The minister said that the channel's ownership is unknown, but the prosecutor will investigate it. Gelestathis added that the same program is also relayed in (Komotini). The minister further noted that the illegal station operates outside the OTE [Greek Telecommunications Organization] installation on Parnis Oros, and it is not yet known from where it gets its electricity. It is likely, he added, that it receives power from some point outside Athens, probably the Turkish Embassy. [passage omitted]

Spokesman Comments on Illegal Television Station

NC1806123992 Athens ET-1 Television Network in Greek 1200 GMT 17 Jun 92

[Text] Government spokesman Viron Polidhoras has said that the issue of broadcasting a Turkish television channel from Parnis Oros is a particularly serious one. Following the government's immediate reaction, the prosecutor stepped in and the equipment must have been confiscated already and the broadcasts terminated.

The spokesman added: The issue is still being investigated, along with the possibility that one of the transmission antennas is installed at the Turkish Embassy. Harmony and order should prevail in the chaotic mass of television stations, Polidhoras added, asking everyone in the mass media to contribute and cooperate on the issue.

Journalist, Others Arrested for Transmitting Turkish Channel

NC1806124592 Athens Elliniki Radhiofonia Radio Network in Greek 1700 GMT 17 Jun 92

[Text] The issue of the discovery of the illegal satellite television station transmitting the Turkish STAR channel from Parnis Oros has assumed considerable proportions. The government's reaction was immediate, and the prosecutor has already raised the issue with the National Intelligence Service. At noon today, journalist Akhilleas Papayeoryiou, who had turned a room in the Marmara Hotel in Kanningos Square into a television studio and relayed programs in Turkish from it, was

arrested. Equipment from a nearby apartment at 63 Khalkokondhili Street was confiscated. Papayeoryiou is not a member of the Union of Athens Daily Newspaper Editors. Three others were arrested and are expected to appear before a prosecutor tomorrow. Our police correspondent Yeoryios Filipakis has more:

[Begin Filipakis recording] Attiki security forces at noon arrested four people, among them a journalist and three technicians, at the Marmara Hotel in Kanningos Square, for relaying a program by a radio-television station connected to a Turkish channel. The journalist is Akhilleas Papayeoryiou. Also arrested were three Educational Television Company technicians who had installed equipment at the Marmara Hotel. Police located a nearby apartment in Khalkokondhili Street, from which they confiscated transmitters, VCR's, television sets, and various pieces of equipment. The issue arose when a television station and three afternoon newspapers revealed that a Turkish program was being relayed in Athens. Ministry of Transport and Communications technicians and State Security police quickly located the transmission point. Preliminary investigation revealed that the four did not intentionally relay the Turkish program, but, during an equipment check, had unwittingly connected with a German television network which carries pictures from Turkish television. [end recording]

SPAIN

Investment in Cable Television Discussed

92WT0206A Madrid CAMBIO 16 in Spanish 15 Jun 92 pp 42-47

[Article by Julia Perez, with information from Hugo Maldonado: "Waiting for Cable"]

[Text] Minister Jose Borrell walked into the assembly hall at the headquarters of the PSOE [Spanish Socialist Workers Party] on Ferraz Street with the completed first drafts of the future satellite and cable TV laws. It was 1700 on 4 June. Inside, some 30 senior party officials and experts on TV were waiting for him to arrive so that they could conduct a closed-door debate on the development of Spain's television system. The meeting lasted only two hours. It was enough time for Borrell to make it clear to the party that they would continue to discuss the unprecedented potential that cable represents, but that he would move forward and submit both laws to a Council of Ministers meeting this month.

The gathering marked the culmination of a behind-the-scenes dispute that has been going on for weeks in the offices of political and economic power. And, with good reason, because cable TV represents a full-fledged revolution that will enable every home to receive between 30 and 350 different channels, from local broadcasts to programs via satellite. It is in local television that the PSOE is fighting its battle. Almost all of Spain's mayors would like to have a local TV station, even

though the most brazen ones have already launched theirs, and even the Episcopal Conference has recommended to its bishops that they promote the establishment of local channels among their flock.

Borrell's desire to have local TV transmitted by cable is causing a great deal of friction because, within the PSOE apparatus, "there are many interests linked to the over-the-air broadcast of existing local stations," internal sources contend.

In other words, the cable of discord Borrell wants is fiber optic, an expensive item that some of the close to 450 local TV stations or EC videos that abound in Spain cannot afford. The law is being drafted to fill the legal vacuum and free up the crowded TV spectrum. Moreover, though, Borrell wants high quality so that cable TV could function as a true communications highway.

The conflicts that Borrell himself, or his predecessor, Jose Barrionuevo, used to encounter on visiting a town will be left unsaid. Their advisers demanded that local TV cameras be withdrawn because they were "illegal," but they had to deal with the sitting governor or mayor. "The fact is that they treat us very well," was the most common response.

Getting wind of new business and as if this were a fresh conquest (it actually is), the big boys have already marked out their turf. Whether they are bankers like Emilio Ybarra, Mario Conde and Jose Maria Amusatogui, or presidents of electric power companies like Fernando Ybarra, or installers like Felipe Benjumea, they have all started companies to promote cable TV.

Jesus de Polanco, the president of Prisa, also wants to get involved in cable along with the rest of the shareholders in Channel +. This group wants to start a pair of specialty channels that will broadcast by satellite, and then hook them up to cable. However, they are also not ruling out forming a company and installing cable in a given city.

The bankers and presidents of electric power and gas companies have such an unusual interest in television because they all aspire to set up and manage their own cable system. Cable, the communications highway, is one of the most powerful mass media available today. Industry executives have done the numbers and estimate that installing a cable network in Spain will require some 700 billion pesetas in investment over the next 10 years.

Cable will give television a boost but will also bring something more in the future. Gas, water and electricity expenses can be monitored; alarms can be connected to the police, which will also be able to monitor a tense street by television; there will be data banks, videoconferences and opinion polls; people will even be able to have their gardens watered via cable. These services will have limited availability at first and enter general use toward the end of the decade.

The private firms feel that, although the cable networks are still monopolies in Spain, the EC will require their decontrol.

"The business of the decade," "the leap to the year 2000," "a fiasco," "either you come with us or we break the deal...." Remarks like these have been heard for two months now in the offices of 50 or so companies. Their executives are making plans. Some will be able to provide the technology, others the money or programs. All are waiting for the law and the technical regulations that will follow to be passed because the public tenders will begin toward the end of the year, they estimate.

They all know that the company headed by Candido Velazquez, Telefonica, will do the installing in the big cities, but they feel that they will have the small ones and that the company will be looking for partners. Telefonica is still analyzing the matter: "We have doubts about profitability," company sources contend.

"They are fighting it out to lose money. It is hair-raising to hear them talk at meetings about the money they estimate they will lose," remarks an engineer with one company. According to sector estimates, cable will not be profitable for the next five years; it is a long-term investment.

The smell of new business has brought executives from big multinational satellite, cable and telecommunications companies to Spain. They are eagerly trying to locate the bill, while visiting offices to seek "local" allies. Even foreign banks are sniffing out the Spanish market because of the magnitude of the investment.

Local television will be authorized first; then, data transmissions will be allowed through. "It has to be done in phases because you cannot put candy out in a school playground right at the start. If you do, the big foreign businesses will eat it up," a cable expert says.

Elena Salgado, the secretary-general of communications, does not think that cable will go on line as soon as the law is passed: "We want acceptable technical conditions. This entails a large enough investment so that they will have to do the numbers and examine profit margins."

In comparison to conventional television, with its standard programming, the combination of cable and satellite TV opens the door to a wide range of specialty channels. The first company formed to install cable, Seteca, contends that, initially, the channels will offer movies, news, documentaries, travelogues, children's programming, musicals, and (in one case) education. In addition, the channel Eurosport wants to broadcast in Spanish.

A Wealth of TV Choices

This leap forward will bring interactive television with it. By simply pushing a button, viewers can decide how a movie ends, inasmuch as there will be 81 different endings for each. They will have access to video games

and even an educational channel that broadcasts classes, answers questions and corrects student mistakes on the professor's office terminal.

TV news programs will be different in this new world of communication; you will be able to delve deeper into a news item by using the remote control. And sophisticated technology will also make its way into sports. If you want to follow a star player, you enter a request, and the game will be shown in its entirety, but with the focus on that player; for this purpose, several cameras will be suspended from a sphere above the playing field. Cable television will have 256 additional services available; people will be able to buy airline tickets and even sell apartments through cable TV.

"It will be a fad. At first people will play a lot and later use it more as a data bank or to play chess with another subscriber," says Edelmiro Lopez, the general manager of Seteca. Lopez, an electronic engineer, thinks that "the cable problem needs to be viewed comprehensively. We will have to set up a sort of funding pool to handle investments and urge government institutions and the local media to become involved."

The question mark to him is what the law will eventually look like. "If it were to regulate only some prominent EC videos, we would have our doubts about entering, as would foreign investors. When all is said and done, it is simply a communications network."

What is most appealing to cable promoters is television a la carte, which is a success in the United States, where for 200 pesetas subscribers buy tickets to an event (a concert, film, or soccer game) that they watch from their couches. This system posted profits of 43 billion pesetas in the United States in 1991, according to the company Kagan World Media.

In the view of Eugenio Galdon, the president of Sevillana de Cable, a firm established by the Seville electric-power company and the banks BBV [Bilbao Vizcaya Bank], Central Hispano, and Banesto, TV a la carte "is the ultimate in consumer choice. Cable TV," he adds, "means the recovery of personal autonomy."

"Cable TV will have trouble making headway in Spain. It represents competition for existing stations and will emerge with major restrictions because the government does not want to lose control over TV." The words are those of a senior executive with an equipment company.

Networks and Leases

The equipment companies are also anxious. The president of the association of electronic industrialists, Jesus Banegas, thinks that the law "should have as few restrictions as possible so that the system can be extended. Cable TV would thus invigorate the market, allow for more channels, and expand the communications network. And this is what progress is about."

The preliminary draft of the law that Borrell wants draws a cable-TV map and specifies that there will be two networks: a national one for operators like Telefonica and a local one. All of the leases will be for 15 years, extendable to 20 in the case of large investments. A difference is established between the carrier (the owner and builder of the cable), the distributor (who rents the network for use), and the TV channel (which produces the programs to be broadcast by cable).

Eugenio Galdon, the former general manager of Ser, thinks that "the investments are so big that, with the spending cuts entailed in the Convergence Plan, if the state or public enterprises are put exclusively in charge of carrying the cable, there will be no cable this century. And the government would be missing an opportunity to bring in the private sector." In his opinion, of Spain's 11.5 million homes, "9 million will have cable."

In the view of Jose Millan, an attorney for Aesdica, the association of cable distributors, "the impact of cable will be noticed first in midsized towns, inasmuch as the projects will take longer in the big cities." He mentions towns in Andalusia, Extremadura, Castile-La Mancha, Valencia, the Basque Country, Galicia, and Asturias as early candidates.

By then, November or December, the private television stations will have decided whether they would like to hold on to the three channels the Spanish satellite Hispasat offers them so that they can also broadcast other programming, which by law will have to be different from today's. Hispasat will also carry the public TV channels and two channels for the Americas that must also meet the same requirement.

The private TV stations are waiting for the law to come out. "There are still too many unknowns," their spokesmen admit, as they add up the numbers to see whether different programming would be profitable.

"We have to take things easy. I cannot imagine that as soon as the law is passed we will all grab our hoes and install cable in Spain," says Pio Cabanillas, the television development director of Prisa, who acknowledges that his group is not ruling out the possibility of forming a partnership to install cable in some municipality. This is the private TV station that is most interested in broadcasting over Hispasat, although, right now, its executives are holding talks on using other European satellites. They want at least two theme channels, one devoted to movies and the other to sports.

Hispasat, people in the sector say, is not profitable without cable TV, which will carry the programs it broadcasts. But how much will cable TV cost? The hookup fee will be approximately 25,000 pesetas, and the government's working documents set a monthly benchmark price of 1,100 to 1,500 pesetas for the basic packages (some 10 channels of public, private, local, and satellite programming). But they say nothing about the interactive services. Sector sources think that all of the services together will cost some 3,000 pesetas per month.

No one wants to disclose their market studies. All they will reveal is the profile of the typical subscriber: urban, middle class, and with young children.

But many believe that satellite and cable television can be a going business. In the United States, where 60 percent of the homes have cable, it was a 600-billion-peseta business last year. In Europe, though, the panorama is varied. Cable is widespread in Belgium and Holland (more than 80 percent of the homes), whereas, in France and Great Britain, it has not had much success (2 percent) owing to competition from other networks, the lack of government support, or poor marketing.

The defenders of cable see the 1990's as its decade and offer projections: In the Europe of the year 2000, 41 million homes will be hooked up, and revenues will total 768 billion pesetas. They predict that the European cable system will be profitable as of 1995.

In the midst of this businessman's dream and this behind-the-scenes political battle, which revolves around extremely thin glass fibers carrying millions of messages in the form of light pulses (fiber optics), Transportation Minister Jose Borrell has conveyed this message to his advisers: Take it easy.

[Box, p 43]

Heading Toward a New Television Cable TV Groups That Have Already Been Formed

Seteca

- Abengoa (50 percent)
- Compagnie Generale des Eaux (25 percent)
- Sociedad Capital Riesgo Sevilla 93 (11 percent)
- Videotron (10 percent) (Canada)
- Figaro Films (4 percent)

Sevillana de Cable

- Compania Andaluza de Telecomunicaciones (51 percent) (Sevillana and the Andalusian Development Institute)
- Nuinsa (9 percent), an affiliate of Sevillana
- BBV (10 percent)
- Central Hispanoamericano (10 percent)
- Multitel (10 percent)
- Banesto (10 percent)

Cableuropa

- Proindesa (45 percent)
- Iberdrola I and BBV
- Banesto (22.5 percent)
- Banco Central Hispanoamericano (22.5 percent)
- Multitel (10 percent)

Groups That Are Considering Involvement in Cable and Satellite

Programming: Prisa (with shareholdings in Canal +), Antena 3, Tele 5, Grupo Z, Galavision, GSC, Eurosport, RTVE [Spanish Radio and Television Company], Catholic parishes and dioceses

Carriers: Telefonica and Retevision, Fenosa, Fecca, Endesa, water and gas companies, Baby Bells (U.S. companies in Silicon Valley [as published]), and PTT (large telecommunications companies, like Pacific Tele-sis)

Operators: Intercable Espana, United, Millisat, Warner Brothers, United Artists, Canon, Columbia, Filmayer Espana, and Iberoamericana de Films

Banks and Finance Companies: CEA (Communications Equality Associates), Daniels, Morgan Stanley, Ambro Bank, Cajamadrid, and the Boston Bank

UNITED KINGDOM

MBC Director Announces Purchase of UPI

NC2906045692 London MBC Television in Arabic
1800 GMT 28 Jun 92

[Text] In a statement reported by world news agencies, Shaykh Walid Ibrahim al-Ibrahim, chairman of the MBC board of directors, has said that MBC has recently purchased United Press International. MBC, he said, will maintain UPI's traditions of objectivity, good reporting standard, and wide coverage of all parts of the world. The statement stressed that UPI will continue to function as an independent body free from any political influences. There are also plans to expand its activities in North Africa, the Middle East, and Asia. The statement pointed out that UPI's technological standards will be promoted to help it compete with the major international news agencies.

It should be recalled that an MBC managerial delegation is currently in Washington to end formalities and to begin meetings with UPI officials.

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